

A STUDY OF THE CHIRONOMIDAE
(DIPTERA) OF AFRICA SOUTH OF
THE SAHARA
PART III

BY
PAUL FREEMAN

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PART III

By PAUL FREEMAN

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SYNOPSIS

Parts I and II of this Study were published as Nos. 1 and 7 of Vol. 4 of the *Bulletin of the British Museum (Natural History)* (1955-56). Part III continues the description of the Chironomid fauna of Africa south of the Sahara (Ethiopian Zoogeographical Region) and deals with the first half of the tribe Chironomini of the subfamily Chironominae, that is, with the large genus *Chironomus* and its allies, which are the genera including species that normally have two spurs on the posterior tibiae.

Following the classification used by F. W. Edwards in 1929, the species described here would represent the first half of the genus *Chironomus*, but the classification adopted in the present paper has reduced the extent of this large genus and uses the principles given in Part II for its restriction. Seven genera are recognized in this group for the African fauna, the genus *Chironomus* being used with seven subgenera. All the genera described by Kieffer and Goetghebuer have been identified with the exception of *Kribiobius* Kieffer which may well have been based on the female of a species of Tanytarsini (= Calopsectrini of Townes). As in the

Orthocladiinae many species resemble Palearctic species, but there is more variety in this subfamily, perhaps because of its larger size and preference for warmer water habitats. Keys are given to genera, subgenera and species; more than 100 species are described, 25 of which are new, and notes are given on 12 species of *Chironomus* (*Cryptochironomus*), which were described by Kieffer from females and which cannot be recognized from the descriptions.

INTRODUCTION

PARTS I and II of this Study were published as Nos. 1 and 7 respectively of Vol. 4 of the *Bulletin of the British Museum (Natural History)* (1955-56). Reference should be made to Part I for a general introduction to the Studies and an historical survey of previous work on the African species; methods of collection and examination, structure, notes on distribution, a key to subfamilies and other points of interest are also covered in that Part. In addition, Part I deals with the species of the subfamilies Tanypodinae, Diamesinae and Clunioninae and mentions the Podominae, whilst in Part II the species of the subfamilies Orthocladiinae and Corynoneurinae are described. Part III describes the species and genera of the first half of the large subfamily Chironominae, that is the genus *Chironomus* and its allies, which are the genera normally with two spurs on the posterior tibia. It is hoped to complete the subfamily Chironominae in the next Part.

Since publication of Part II, I have received collections from Dr. B. Stuckenberg, Natal Museum, which he has made both in Natal and also in Madagascar, from Dr. P. S. Corbet made in Uganda and from Dr. B. McMillan of the Nigerian Health Department. Mr. E. T. M. Reid has moved from Sudan to S. Rhodesia and has continued sending me collections from this new locality, both collected by himself and by Mr. Smithers, Agricultural Entomology Laboratory, Salisbury. I should like to thank all these gentlemen for their assistance in sending me material for study.

SUBFAMILY CHIRONOMINAE

Eyes with dorsal narrow portion (except in *Pseudochironomus* and in one or two other aberrant, non-African genera); male antennae plumose and with 11-14 segments, female antennae with 5-7 segments. Pronotum sometimes collar-like, but often reduced and not visible from above, postnotal furrow distinct. Anterior tibia terminating on the inner side in a "scale" which may be low and rounded or oval and more produced or it may carry a bristle-like spur (the non-African genus *Pseudochironomus* has a conspicuous spur on this tibia); middle and posterior tibiae normally with two apical combs composed of basally fused spinules, the tibial spurs are associated with these combs but one or both spurs may be reduced or absent, combs may be fused or separate. Anterior basitarsus at least as long as, and nearly always longer than, the tibia (L.R. more than 1). True base of M_{3+4} never present, R_{2+3} present but never connected to R_1 by a cross-vein; costa almost always ending abruptly at tip of R_{4+5} . Male hypopygium not inverted, styles directed rigidly backwards and without terminal spine, coxites usually with two or more basal appendages (reduced and occasionally absent in *Chironomus* subg. *Cryptochironomus*).

As already pointed out in previous Parts, the majority of the species of Chironomidae from Africa south of the Sahara fall into this subfamily, a fact which is in accord with the work of entomologists in the Palaearctic Region, who have found that species of this subfamily are especially typical of warm water environments. In the Orthoclaadiinae (Part II) it was shown that the fauna closely resembled the Palaearctic fauna and the same is true of the Chironominae. Many of the species fall into groups which have been recognized in the Palaearctic fauna, but as might be expected, there is more variety and the emphasis is often different, that is, the commoner Palaearctic genera are not necessarily those which are the most abundant in Africa.

Kieffer was the first author to split up the old genera *Chironomus* and *Tanytarsus* and in his paper on the African Chironomidae (1921, *Ann. Soc. ent. France*, **90** : 1-56) he recognized over 70 genera, though not all with African representatives. Of the 39 genera in which he placed the African species in this and the two succeeding parts of the series, 25 are described as new. The majority of the new genera begin with one or other of the prefixes "*Kribi-*" and "*Nilo-*," depending on whether they were described from species found at Kribi in the French Cameroons or from the Nile in the southern part of the Sudan. Goetghebuer in his papers on the African Chironomidae was only able to recognize three of these new genera and he has himself added a further three. A fourth genus, *Kribioxenus* Kieffer, has been used by Goetghebuer, Edwards and Townes for some holarctic species, but, as shown below, this is incorrect and the species should really be placed in *Nilothauma* Kieffer. The recognition and re-definition or the placing in synonymy of these genera is one of the main problems of this Study.

As a primary character, Kieffer used the presence of macrotrichia on the wing membrane to split off "*Groupe Tanytarsus*" which included *Pentapedilum*. The genera with bare wings which he termed "*Groupe Chironomus*", were divided into major groupings by the number of spurs on the posterior tibiae. Genera were then separated to a great extent on the detailed structure of the combs, spurs and pulvilli, whilst antennal segmentation of one or both sexes, male hypopygial structure and wing pattern were used as subsidiary characters. Some of these characters are trivial and certainly not of generic value, others, especially characters of pulvilli do not exist. For example, he stated that in *Cladopelma* and *Stenochironomus* the pulvilli were branched on the median side, in *Dicrotendipes* they were narrow and half as long as the claws, whilst in *Chironomus* they were large and not branched. I have made stained preparations of pulvilli of species belonging to these genera and known to Kieffer and can see no differences between the pulvilli of any of them, and I am forced to conclude that he must have examined them from different aspects or under different conditions. On the other hand he is quite correct in stating that the pulvilli in *Polypedilum* are split longitudinally.

Edwards (1929), *Trans. ent. Soc. Lond.* **77** : 279-430) has laid the foundations of the modern classification of the subfamily, but as in the Orthoclaadiinae, he went to the opposite extreme to Kieffer and used very large genera which he subdivided into subgenera, species groups and series. Although Edwards's main concepts of groups have been accepted by later authors, few have accepted his large genera which have

been found to be unwieldy and difficult to use. One of the great difficulties in classifying the subfamily is the presence of intermediate species linking many of the groups, but even so, I think that it is possible to achieve a greater degree of subdivision than was advocated by Edwards. The classification which I am offering is probably nearer to that of Goetghebuer (1937, in Lindner, *Flieg. Pal. Reg.* 3 (13c)), but there are a number of differences of opinion. I do not go as far as Townes (1945, *Amer. midl. Nat.* 34: 1-206) in splitting into genera, nor do I agree with all of his radical changes in relationships.

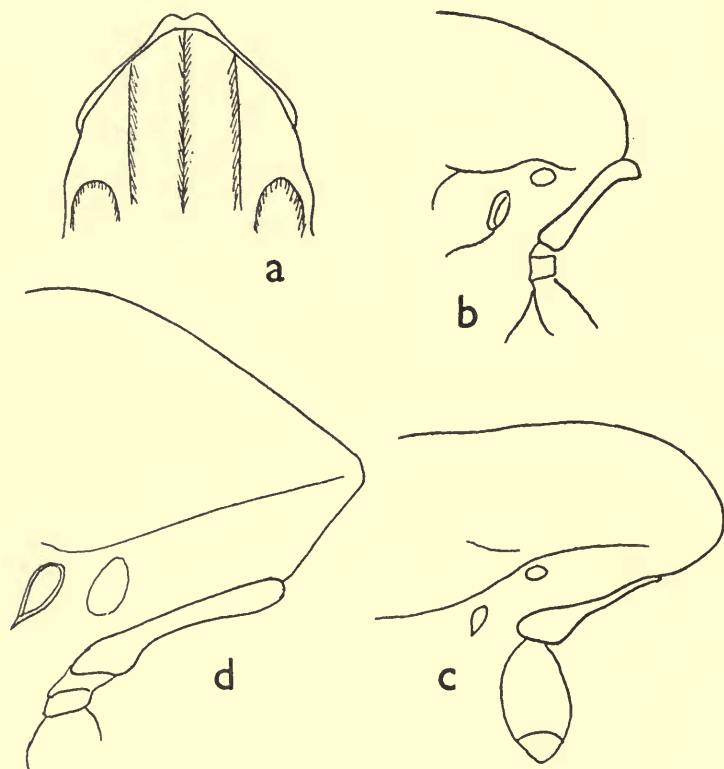


FIG. 1. Anterior halves of thoraces to show prothorax. (a) *Chironomus cafrarius*, dorsal view; (b) the same in lateral aspect; (c) *Stenochironomus atroconus*, lateral aspect; (d) *Collartiella hirsuta*, lateral aspect.

Edwards (1929) was the first author to indicate the importance to classification of the size of the prothorax and he used it as one of the main characters for splitting his large genus *Chironomus* into subgenera. Goetghebuer and Townes have both followed Edwards in the use of this character.

KEY TO TRIBES OF SUBFAMILY CHIRONOMINAE

Wing membrane without macrotrichia, or if present then squama with marginal fringe of long hairs; cross-vein r-m definitely oblique to direction of vein R_{4+5}

CHIRONOMINI

Wing membrane with macrotrichia at least towards the apex, squama without fringe; cross-vein r-m nearly parallel to and practically continuous with R_{4+5}

TANYTARSINI (= Calopsectrini of Townes) (see later part)

TRIBE CHIRONOMINI

Only one half of this tribe is dealt with in this Part, a later Part will describe species both in the other half and in the Tanytarsini.

Apart from a few small and aberrant genera, the tribe was divided by Kieffer into two groups depending on whether the posterior tibia had one or two spurs in association with the combs. This method of dividing the bulk of the species was also adopted by Edwards and Goetghebuer and for most species it is perfectly satisfactory. Genera can then be split off on the development of the prothorax, size of pulvilli and presence of front tibial spur.

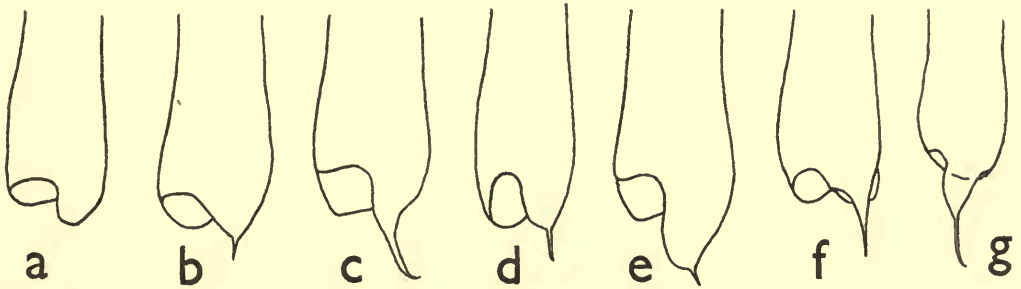


FIG. 2. Apices of anterior tibiae. (a) *Chironomus pulcher*; (b) *C. (Endochironomus) woodi*; (c) *Nilodosia fusca*; (d) *Henrardia quadrispinosa*; (e) *Stenochironomus atroconus*; (f) *Paratendipes crosskeyi*; (g) *Nilothauma pictipenne*.

However, several genera of the two-spurred group contain species in which the spurs are reduced to one or are even completely absent, but which seem otherwise to be quite typical; also, in *Collartiella* the number of spurs may be different on the two sides of the same specimen. It might be thought advisable to choose other and more reliable characters to replace the spur number for the main division of the group, but no other character seems to divide the genera into such natural series. For instance, the great reduction of the prothorax seen in *Stenochironomus* a genus with two spurs, is also shown to some extent by *Microtendipes* which has only one spur. Other characters such as male hypopygial structure and presence of acrostichal bristles do not bear out a close relationship of the two genera and it seems more likely that the resemblance is caused by convergence.

I am therefore adopting Kieffer's original method of dividing the tribe, but I have found it to be necessary to modify some of the definitions because of the presence of species more or less intermediate between genera and because of the presence of single-spurred species in genera normally two-spurred. Further study has shown

that some of the groups which I previously treated as genera cannot be considered of more than subgeneric status. Only those genera which normally have two spurs on the posterior tibiae are treated in this Part, and the key to genera covers all genera in this section ; genera dealt with in the next Part will be fully keyed there.

I have been able to identify and report on all the genera described by Kieffer and Goetghebuer falling into this section of the tribe with the exception of *Kribiobius* Kieffer. This appears to have been based on the female of a species of *Tanytarsus* and will be dealt with in Part IV.

KEY TO AFRICAN GENERA OF TRIBE CHIRONOMINI—SECTION I

(Includes genera normally with two spurs on posterior tibia)

1. Posterior tibia with two spurs, that is each comb with a spur 2
 Posterior tibia either with a single spur on the small outer comb and the larger outer comb unarmed, or with neither comb spurred 10
2. Pulvilli large and indistinct 3
 Pulvilli absent or indistinguishable 6
3. Prothorax reaching up to front of mesonotum, visible from above, often collar-like, sometimes divided by a suture but with the two halves touching (Text-figs. 1, a, b)
Chironomus Meigen
 Prothorax more reduced, not visible from above 4
4. Middle tibia with four spurs on outer comb (Text-fig. 14, d) ; mesonotum not cone-shaped *Henrardia* Goetghebuer
 Middle tibia with one spur on each comb ; mesonotum cone-shaped and projecting over head (Text-figs. 1, c, d) 5
5. Mouthparts very reduced, palpi 2-segmented, body with tufts of long hair
Collartiella Goetghebuer
 Mouthparts normal, palpi with 4 segments, body without tufts of long hair
Stenochironomus Kieffer
6. Anterior tibia without spur or spine at apex of scale 7
 Anterior tibial scale armed with spur or spine 8
7. Squama bare *Paratendipes* Kieffer, in part
 Squama fringed, palpi greatly reduced *Chironomus* subg. *Halliella* Kieffer, in part
8. Prothorax greatly reduced, male antenna with last segment hardly as long as preceding 3 together *Nilothauma* Kieffer
 Prothorax nearly reaching front of mesonotum, A.R. at least 0.8 and often more 9
9. Anterior tibia with conical scale terminating in a curved spine (Text-fig. 2, c), male hypopygium with 2 coxite appendages *Nilodosis* Kieffer
 Anterior tibial scale not projecting beyond end of tibia, spine short and straight (Text-fig. 2, f) ; 3 coxite appendages *Paratendipes* Kieffer
10. Pronotum reaching up to front of mesonotum, visible from above, although it may be narrow and with a central suture ; pulvilli large and distinct
Chironomus Meigen, in part
 Pronotum more reduced, not visible from above 11
11. Mesonotum projecting as a cone above the head, pronotum much reduced (Text-figs. 1, c, d) ; acrostichal bristles well formed and in a double row reaching back to centre of thorax 12
 Mesonotum either not like this or else acrostichal bristles only present at apex of cone SEE PART IV
12. Mouthparts very reduced, palpi only 2-segmented ; body and femora with tufts of long hair *Collartiella* Goetghebuer
 Mouthparts normal, palpi with 4 segments ; body and legs without tufts of long hair *Stenochironomus* Kieffer, in part

Genus *CHIRONOMUS* Meigen

Chironomus Meigen, 1803, *Illiger's Mag.* 2 : 260.

Halliella Kieffer, 1911, *Rec. Ind. Mus.* 6 : 172.

Dicrotendipes Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1 : 23.

Endochironomus Kieffer, 1918, *Ann. Mus. nat. Hung.* 16 : 69.

Cryptochironomus Kieffer, 1918, *Ent. Mitt.* 7 : 46.

Limnochironomus Kieffer, 1920, *Ann. Soc. sci. Brux.* 39 (1) : 166.

Xenochironomus Kieffer, 1921, *Bull. Soc. Hist. nat. Moselle*, 29 : 69.

Chironomus subgg. *Chironomus* and *Endochironomus* Edwards, 1929, *Trans. ent. Soc. Lond.*

77 : 380 and 393.

Tendipes Goetghebuer, 1937, in Lindner, *Flieg. Pal. Reg.* 3 (13c) : 18 ; Townes, 1945, *Amer. midl. Nat.* 34 : 101.

Male antenna with 12 segments (14 in some species of *Endochironomus*), and usually 6 in the female ; frontal tubercles frequently present ; palpi usually long though reduced in subgenera *Halliella* and *Nilodorum* and occasionally elsewhere. Prothorax reaching up to front of thorax where it may form a collar with or without emargination in the centre ; often with a centrally dividing suture, but the two halves are close together and not widely separated. Anterior tibia without spur (Text-fig. 2, a) except in a few species of *Endochironomus* (Text-fig 2, b), combs of middle and posterior tibia large and each with a short spur ; spurs reduced or even absent in occasional species ; pulvilli large and broad, except in one species of *Halliella*. Wing membrane without macrotrichia ; squama with complete fringe, cross-vein distinct and oblique, posterior fork below or slightly beyond cross-vein, R_{2+3} ending only a little beyond tip of R_1 . Abdomen without mid-dorsal impressions.

The genus *Chironomus* as here defined includes all the species groups placed by Edwards (1929) in his subgenera *Chironomus* s. str. and *Endochironomus*. Its main characters are the size of the prothorax which reaches up to the front of the mesonotum, combined with large pulvilli and two tibial spurs. I have found it impossible to restrict definition of the genus further as was done by Townes (1945) because of intergrading and because some of the best characters for group definition lie in the male genital structures and are therefore not applicable to the female. For this reason I am discontinuing my earlier use of *Cryptochironomus*, *Dicrotendipes*, *Nilodorum* and *Endochironomus* as full genera and am considering them to be subgenera only. The advantage of this system is that whilst names are employed for groups which can normally be easily identified in one or both sexes, such as *Nilodorum*, the presence of intergrading forms is recognized by treating them as subgenera only. In addition, it is my opinion that it is essential to employ as genera, groups which can be recognized infallibly in both sexes. A fuller account of the synonymy and use of genera by different authors is given under the various subgenera.

KEY TO SUBGENERA OF *Chironomus* FROM AFRICA SOUTH OF THE SAHARA

1. Prothorax collar-like and with a well-marked V-shaped emargination in the middle ; thorax usually with lines of pruinosity along the lines of bristles ; frontal tubercles present and elongate ; male hypopygium with both appendages 1 and 2 present, appendage 2 broad and straight and with long curved hairs at the apex

Chironomus s. str.

- Prothorax usually narrower and applied to the front of the mesonotum with a centrally dividing suture, occasionally collar-like, but then at the most with a shallow central emargination; thorax without lines of pruinosity; frontal tubercles absent or small; appendage 2 often racket-shaped, narrower basally, or reduced 2
2. Palpi very short, segments not more than 2-3 times as long as broad; thorax thickly covered with grey dusting; male appendages 1 and 2 both well developed 3
- Palpi only rarely short, segments usually about 6 times as long as broad; thorax with thin grey dusting only in a few species 4
3. Pronotum collar-like *Halliella* Kieffer
- Pronotum narrow, closely applied to front of mesonotum *Nilodorum* Kieffer
4. Appendages 1 and 2 both well developed; anterior tarsi with segment 5 cylindrical 5
- Either appendage 1 or 2 or both reduced and rudimentary; fifth segment of anterior tarsus flattened 6
5. Appendage 2 narrower basally and curved or bowed upwards; male antenna always 12-segmented, female 6-segmented; front tibiae never spurred . . . *Dicrotendipes* Kieffer
- Appendage 2 of more even width, not curved upwards or bowed; male antenna sometimes 14-segmented and that of female may be either 6 or 7; anterior tibia sometimes spurred *Endochironomus* Kieffer
6. Appendage 2 of male well formed, reaching beyond end of coxite and with curved hairs at the tip *Xenochironomus* Kieffer
- Appendage 2 not reaching beyond end of coxite, without long curved hairs and often either rudimentary or absent *Cryptochironomus* Kieffer

Chironomus MEIGEN SUBGENUS *Chironomus* SENSU STRICTO

- Chironomus* Meigen, 1803, *Illiger's Mag.* 2: 260; Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, 13: 158; Kieffer, 1911, *Trans. Linn. Soc. Lond. (Zool.)* 14: 351 (in part); Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1: 14; Kieffer, 1914, *Ann. S. Afr. Mus.* 10: 263; Kieffer, 1918, *Ann. Mus. nat. Hung.* 16: 66 (in part); Kieffer, 1923, *Ann. Soc. sci. Brux.* 42 (1): 382; Kieffer, 1924, *ibid.* 43 (1): 260; Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* 25: 197; Freeman, 1955, *S. Afr. Animal Life*. Uppsala 2: 370.
- Calochironomus* Kieffer, 1922, *Ann. Soc. ent. France*, 91: 66 (in part); Kieffer, 1923, *Ann. Soc. sci. Brux.* 42 (1): 383 (as subg. of *Chironomus*); Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924: 290 (in part).
- Einfeldia* Kieffer, 1924, *Ann. Soc. sci. Brux.* 43 (1): 393.
- Chironomus* subg. *Chironomus* Group B Edwards, 1929, *Trans. ent. Soc. Lond.* 77: 382.
- Chironomus* subg. *Calochironomus* and *Chironomus* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 467 and 470; Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* 23: 17 and 18.
- Chironomus* subg. *Chironomus* and *Einfeldia* Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83: 13; Freeman, 1955, *Explor. Parc Nat. Upemba*, Miss. de Witte, fasc. 35 (6): 96-97.

Frontal tubercles present and elongate in all African species, palpi long except in *tetraleucus*; prothorax collar-like and with central V-shaped emargination; thorax often with pruinose lines; male hypopygium with both appendages 1 and 2 present. Appendage 1 in the African species usually curved and bare, arising from a basal pubescent pad, but in some species the pad is extended and the curved bare part reduced (*Einfeldia* Kieffer); appendage 2 broad and straight, with long curved hairs at the apex; styles in most species contracted on about apical third and with a close-set row of short stiff bristles on inner side at tip.

The subgenus *Chironomus* as used here includes species of the so-called "*plumosus*"

group together with those placed by Edwards in *Einfeldia*. All the species have a large collar-like pronotum, which is centrally emarginate and have appendages 1 and 2 well developed. I am rejecting *Einfeldia* because it does not seem to be a natural group and is based on the development or otherwise of the basal pubescent pad of appendage 1, a feature not always easy to appreciate.

Seventy species from Africa south of the Sahara have been placed in *Chironomus*, 52 of them having been described by Kieffer. In addition Kieffer has described four species of *Chironomus* s. str. in *Calochironomus* and one in *Cryptochironomus*; two of those placed in *Calochironomus* (*C. oxylabis* and *niliicola*) are synonyms of *Chironomus formosipennis*, the other two (*C. niliacus* and *hexastictus*) are synonyms of *Chironomus calipterus*; *Cryptochironomus fasciatus* seems to be a synonym of *Chironomus imicola*. Tables I and II detail the species described in *Chironomus* and show their position in the present Study. I am recognizing 18 species in the subgenus from the Region.

TABLE I.—*Species from Africa Described by Kieffer in Chironomus*

Date	Original specific name	Position in present study
1908	<i>calipterus</i>	<i>Chironomus</i> s. str.
	<i>formosipennis</i>	<i>Chironomus</i> s. str.
	<i>longicornis</i>	See under <i>C. (C.) cafferarius</i>
	<i>tripunctatus</i>	<i>C. (C.) pulcher</i>
	<i>schultzei</i>	? mixed series; see <i>C. (C.) tetraleucus</i>
	<i>africanus</i>	See under <i>C. (C.) transvaalensis</i>
	<i>apicalis</i>	See under <i>C. (C.) callichirus</i>
	<i>apricus</i>	See under <i>C. (C.) cafferarius</i>
1911	<i>callichirus</i>	<i>Chironomus</i> s. str.
	<i>scotti</i>	<i>Chironomus</i> s. str.
	<i>brunneicornis</i>	<i>Polypedilum</i>
	<i>linearis</i>	<i>Chironomus</i> s. str.
	<i>leptogastrus</i>	<i>C. (C.) linearis</i>
	<i>binotatus</i>	subg. <i>Dicrotendipes</i>
	<i>chloronotus</i>	subg. <i>Dicrotendipes</i>
	<i>melanophilus</i>	<i>Polypedilum</i>
	<i>seychelleanus</i>	<i>C. (C.) callichirus</i>
	<i>pandani</i>	<i>Polypedilum</i>
	<i>limnocharis</i>	<i>Polypedilum</i>
	<i>nocticolor</i>	<i>Polypedilum</i>
	<i>nigratipes</i>	Gen. nov. see Pt. IV
1913	<i>taitae</i>	<i>Microtendipes</i>
	<i>tavetae</i>	<i>C. (C.) calipterus</i>
	<i>palustris</i>	<i>C. (C.) formosipennis</i>
	<i>tropicalis</i>	subg. <i>Cryptochironomus</i>
	<i>tangae</i>	<i>C. (C.) scotti</i>
	<i>kikuyui</i>	? subg. <i>Cryptochironomus</i>
	<i>alluaudi</i>	<i>Chironomus</i> s. str.
	<i>nairobii</i>	<i>C. (C.) pulcher</i>
	<i>imicola</i>	<i>Chironomus</i> s. str.

1914	.	<i>tetraleucus</i>	.	<i>Chironomus</i> s. str.
		<i>iricolor</i>	.	<i>C. (C.) formosipennis</i>
		<i>cafrarius</i>	.	<i>Chironomus</i> s. str.
		<i>capensis</i>	.	<i>C. (C.) cafrarius</i>
		<i>lamprogaster</i>	.	<i>Microtendipes</i>
		<i>sensualis</i>	.	<i>C. (C.) pulcher</i>
1918	.	<i>bisignatus</i>	.	<i>Stictochironomus</i>
		<i>natalensis</i>	.	<i>Polypedilum</i>
		<i>ornatipennis</i>	.	<i>Polypedilum</i>
		<i>brevipalpis</i>	.	subg. <i>Nilodorum</i>
		<i>brevicornis</i>	.	subg. <i>Cryptochironomus</i>
		<i>guineensis</i>	.	<i>C. (C.) scotti</i>
1923	.	(<i>Ann. Soc. sci. Brux.</i>)		
		<i>pictiventris</i>	.	<i>C. (C.) formosipennis</i>
		<i>rostratiforceps</i>	.	<i>C. (C.) linearis</i>
		<i>latilobus</i>	.	subg. <i>Dicrotendipes</i>
		<i>biclavatus</i>	.	<i>C. (C.) tetraleucus</i>
		<i>leucochlorus</i>	.	<i>Chironomus</i> s. str.
		<i>transvaalensis</i>	.	<i>Chironomus</i> s. str.
		<i>peringueyi</i>	.	<i>Chironomus</i> s. str.
1923	.	(<i>Ann. Soc. ent. Fr.</i>)		
		<i>niligenus</i>	.	subg. <i>Cryptochironomus</i>
		<i>niloticus</i>	.	subg. <i>Dicrotendipes</i>
1924	.	<i>albomarginatus</i>	.	<i>C. (C.) callichirus</i>

TABLE II.—*Species from Africa Described in Chironomus by Authors other than Kieffer*

Author and date	Original name	Position in present study
Wiedemann, 1830	<i>pulcher</i>	<i>Chironomus</i> s. str.
Goetghebuer, 1934	<i>palpalis</i>	<i>C. (C.) imicola</i>
Goetghebuer, 1936	<i>bellus</i>	<i>C. (C.) scotti</i>
	<i>bipustulatus</i>	<i>Stenochironomus</i>
	<i>breDOI</i>	subg. <i>Dicrotendipes</i>
	<i>caligans</i>	<i>C. (Nilodorum) fractilobus</i>
	<i>congolensis</i>	<i>Chironomus</i> s. str.
	<i>duboisii</i>	<i>C. (C.) scotti</i>
	<i>henrardi</i>	subg. <i>Dicrotendipes</i>
	<i>reginae</i>	<i>C. (C.) imicola</i>
	<i>schwetzi</i>	<i>C. (C.) pulcher</i>
	<i>seydeli</i>	<i>Chironomus</i> s. str.
	<i>surdellus</i>	<i>C. (Nilodorum) brevipalpis</i>
	<i>vaneyeni</i>	<i>C. (C.) scotti</i>
	<i>vitshumbiensis</i>	<i>C. (Nilodorum) brevipalpis</i>
Freeman, 1954	<i>nivalis</i>	<i>C. (C.) callichirus</i>
	<i>brunneus</i>	<i>Chironomus</i> s. str.
Freeman, 1955	<i>rostrifer</i>	<i>C. (C.) seydeli</i>

KEY TO AFRICAN SPECIES OF *Chironomus* S. STR., BASED MAINLY ON MALE CHARACTERS

1. Wings with distinct clouds, especially in cell R_{4+5} 2
 Wings without clouds, at most faintly iridescent in anal and fork cells 3
2. Large species, wing length 3.5–5.5 mm., abdomen with elongate or oval black spot on at least segments 2–4, wing as in Pl. 1, fig. *b* *formosipennis* Kieffer
 Small species, wing length 2.5 mm., abdomen yellowish-brown and without distinct markings, wings as in Pl. 1, fig. *a* *calipterus* Kieffer
3. Abdomen with segments 1–6 plain green, without any trace of dark markings 4
 Abdomen with at least a trace of dark markings on at least segments 2–4 5
4. Wing length about 3.5 mm., prothorax larger than usual, male hypopygium as in Text-fig. 3, *a* *scotti* Kieffer
 Wing length 3.0 mm., prothorax normal, male hypopygium (Text-fig. 4, *a*) highly characteristic *acuminatus* sp. n.
5. Anterior tarsi of male with distinct and often strong beard composed of long hairs 6
 Beard absent 9
6. Anterior tarsal beard strong and bushy 7
 Beard weak 8
7. Legs not thicker than usual, abdomen of male with definite spots, hypopygium as in Text-figs. 3, *f*, *o* *caffrarius* Kieffer
 Legs thick, abdomen almost completely dark, male hypopygium as in Text-figs. 4, *d*, *i* *tetraleucus* Kieffer
8. Abdomen mainly blackish *brunneus* Freeman
 Abdomen green with black spots on segments 1–5 *alluaudi* Kieffer
9. Anal point short, broad and downturned, female femora blackened apically 10
 Anal point narrow, longer and not strongly downturned 11
10. Anal point rounded at apex in side view (Text-fig. 4, *g*), wing length 3–3.5 mm. *imicola* Kieffer
 Anal point pointed at apex in side view (Text-fig. 4, *h*), wing length 5.0 mm. *seydeli* Goetghebuer
11. Legs distinctly darkened at the knees or apices of femora or bases of tibiae 12
 Legs without these dark markings 13
12. Thorax with an extra pruinose line along lateral stripe, wing length 3.5–4 mm. *callichirus* Kieffer
 Lateral stripes without line of pruinosity, wing length 2.5 mm. *linearis* Kieffer
13. Anterior femora one and a half times as long as tibiae, small dark species, wing length 2.5 mm. *congolensis* Goetghebuer
 Anterior femora at most one and a quarter times as long as tibiae 14
14. Anal point deep at base in side view (Text-figs. 3, *m*, *n*) 15
 Anal point of more even width (Text-figs. 3, *j*, *l*) 16
15. Male hypopygium as in Text-figs. 3, *e*, *n*, anal point shorter and more downturned *transvaalensis* Kieffer
 Male hypopygium as in Text-figs. 3, *d*, *m*, anal point longer and straighter, appendage 2 narrower *leucochlorus* Kieffer
16. Anal point bent in side view and blunt ended (Text-fig. 3, *j*), appendage 2 with fewer hairs 17
 Anal point less bent (Text-fig. 3, *l*), appendage 2 with more hairs, segment 6 of female antenna without long sensory hairs *satchelli* sp. n.
17. Segment 6 of female antenna with about 8 long sensory hairs, each two-thirds length of segment *pulcher* Wiedemann
 Segment 6 of female antenna with normal sensory hairs, each about a quarter or one-third length of segment *peringueyi* Kieffer

Chironomus (Chironomus) pulcher Wiedemann

Chironomus pulcher Wiedemann, 1830, *Aussereurop. Zweifl. Ins.* 2 : 615.

Chironomus tripunctatus Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, 13 : 160 (SYN. NOV.).

Chironomus nairobii Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1 : 19; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83 : 14 (SYN. NOV.).

Chironomus sensualis Kieffer, 1914, *Ann. S. Afr. Mus.* 10 : 267; Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* 23 : 17; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, 2 : 370 (SYN. NOV.).

Chironomus schwetzi Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 27 : 476 (SYN. NOV.).

Although I have not seen the types of *pulcher* and *tripunctatus*, the descriptions leave little doubt that they are earlier descriptions of the species to which I have previously referred as *sensualis*. My earlier identification of *nairobii* as a distinct species is incorrect and I am now satisfied that this is a synonym of *pulcher*. Typical South African males have the styles strongly constricted and appendage 2 fairly long; specimens from Central and West Africa have the styles less constricted and appendage 2 shorter and were described by Goetghebuer as a distinct species *schwetzi*. It is possible to find intermediates and specimens occur in which the styles are strongly constricted and appendage 2 is short and vice versa. There does not seem to be a well-defined area of overlap and I am forced to regard *schwetzi* as a synonym instead of a geographical race.

Green with reddish scutal stripes and dark spots on abdominal segments, wings unmarked, anterior tarsi without beard, anterior tibiae hardly shorter than femora. Very similar to a number of other species but readily distinguished if females are present by the extraordinarily long sense bristles on the sixth antennal segment, each being about two-thirds length of segment. Male hypopygium with anal point narrow, blunt-ended and curved in side view, appendage 2 with only about 11–12 curved hairs.

Male. Wing length 3–3.75 mm.

Head greenish-yellow, palpi dark, pedicel reddish, A.R. about 3, frontal tubercles present. *Thorax* green or yellowish; stripes, apex of postnotum and sternopleuron reddish-yellow; prothorax of normal size, dorso-central hairs pale, irregularly biserial, uniserial posteriorly; pruinose on shoulders, along lateral margins and lines of bristles, with a break between pruinosity on shoulders and that along line of dorso-central bristles. *Legs* yellowish-green, tarsal segments darker at apices, L.R. about 1.5, anterior tibia almost subequal to femur. *Wings* unmarked except for slight darkening at cross-vein, halteres pale. *Abdomen* green or yellowish with dark markings: segment 1 usually plain, segments 2–4 with a central, more or less round blackish spot variable in size and intensity, 5–7 more generally dark, at least in dried specimens, and usually conspicuously pruinose. Hypopygium (Text-figs. 3, a, j) in typical South African specimens with styles very sharply constricted at about the middle, basal half broader than in other species, appendage 2 with only about 11–12 curved hairs, anal point rather longer than appendage 2, blunt-ended and curved in side view; in specimens from Central and West Africa there is a tendency for the styles to be much less strongly constricted and for appendage 2 to be shorter (see above).

Female resembles male but abdomen tends to be darker in dried specimens; antennae quite characteristic, segments 2-5 with long narrow necks, neck as long as basal portion in segments 3-5, hairs of hair whorls twice as long as segments, segment 6 one and a half times as long as 5 and with about 8 long curved sense hairs, each being two-thirds length of segment.

I have seen males of the type series of *nairobii* which are in Muséum National d'Histoire Naturelle, Paris (type locality, Kenya: Kyambu, St. Benoit); females from the type series of *sensualis* which are in South African Museum, Cape Town (locality, Cape Town); and the holotype male of *schwetzi* in Musée Royal du Congo Belge, Tervuren (locality, BELGIAN CONGO: Kabinda). Type locality of *pulcher* "Cape", of *tripunctatus* S.W. AFRICA: Rooibank.

DISTRIBUTION. Common and widely distributed; I have seen specimens from: Cape Province, Natal, Transvaal, S. Rhodesia, Nyasaland, Belgian Congo (Elisabethville, Kabinda and Ruanda Urundi), Uganda, Kenya, Nigeria, Dahomey, Gold Coast, Haute Volta, Sierra Leone, Gambia, Madagascar (Perinet).

Chironomus (Chironomus) scotti Kieffer

Chironomus scotti Kieffer, 1911, *Trans. Linn. Soc. Lond. (Zool.)* **14**: 352.

Chironomus tangae Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* **1**: 18 (SYN. NOV.).

Chironomus guineensis Kieffer, 1918, *Ann. Mus. nat. Hung.* **16**: 71 (SYN. NOV.).

Chironomus bellus Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **27**: 472 (SYN. NOV.).

Chironomus duboisi Goetghebuer, 1936, *ibid.* 475 (SYN. NOV.).

Chironomus vaneyeni Goetghebuer, 1936, *ibid.* 478 (SYN. NOV.).

The male of this species differs from *pulcher* only by there being no dark spots on segments 2-4 of the abdomen and by the prothorax often appearing larger than usual. In the female dark spots can be distinguished on the abdomen in a well-preserved specimen, but it may be separated from *pulcher* by the structure of the last antennal segment which is dark, equal to segments 3-5 together and bears well-developed but not long sensory hairs. In all other respects, including the male hypopygium, the two species are identical.

Part of the type series of *scotti* is in the British Museum. I select the single male as lectotype, type locality SEYCHELLES: Mahé. I have seen the type of *tangae* which is in Muséum National d'Histoire Naturelle, Paris (locality, TANGANYIKA: Tanga). The types of Goetghebuer's species are all in Musée Royal du Congo Belge, Tervuren, where I have been able to examine them; type locality of *bellus* BELGIAN CONGO: Rutshuru and Kabasha, of *duboisi* Léopoldville, of *vaneyeni* Bas-Congo, Lemfu. The type of *guineensis* is probably lost, locality, FRENCH GUINEA: Mamou. Although the type locality is Seychelles, there seems to be no point of difference between these specimens and mainland ones; the differences mentioned by Goetghebuer are trivial and subject to variation and I am therefore regarding all as synonyms of the earliest name.

DISTRIBUTION. It has a wide distribution and I have seen specimens from: Seychelles, Transvaal, Nyasaland, Angola, Belgian Congo, French Cameroons, Nigeria, Gold Coast, Haute Volta, Kenya, Sudan, Ethiopia.

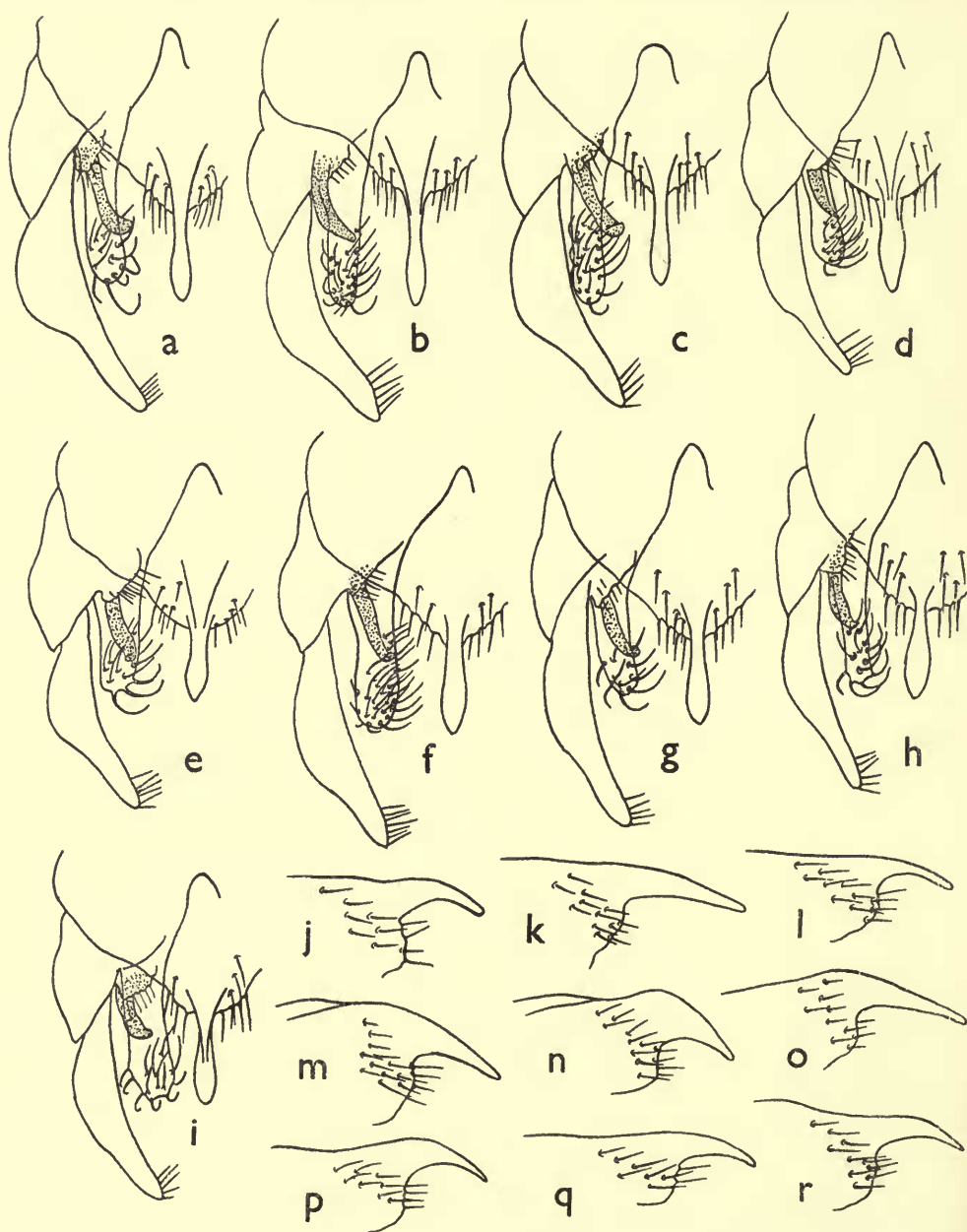


FIG. 3. Male hypopygia of *Chironomus* subg. *Chironomus*; (a)–(i) in dorsal aspect, (j)–(r) anal point in lateral aspect. (a) *C. pulcher*; (b) *C. alluaudi*; (c) *C. satchelli*; (d) *C. leucochlorus*; (e) *C. transvaalensis*; (f) *C. caffrarius*; (g) *C. callichirus*; (h) *C. congolensis*; (i) *C. linearis*; (j) *C. pulcher*; (k) *C. alluaudi*; (l) *C. satchelli*; (m) *C. leucochlorus*; (n) *C. transvaalensis*; (o) *C. caffrarius*; (p) *C. callichirus*; (q) *C. congolensis*; (r) *C. linearis*.

Chironomus (Chironomus) peringueyi Kieffer

Chironomus peringueyi Kieffer, 1923, *Ann. Soc. sci. Brux.* 42 (1) : 386.

I have seen the holotype female of this species which is in South African Museum. It is very similar to *scotti* in antennal structure, colour and general appearance; the abdomen has dark spots on segments 2-4. A series from French Cameroons and another from Tanganyika with females closely resembling the type have males indistinguishable from *pulcher*. Until more material can be collected in the type locality and the limits of the species more fully understood, I am regarding the species as distinct. The wing length of specimens known to me is 2.75-3 mm.

The type locality "Marley" quoted by Kieffer is the collector's name; the true locality on the holotype is Krautz Kloof (near Durban).

DISTRIBUTION. NATAL: Krautz Kloof. TRANSVAAL: 5 ♀, Waterval, Lydenburg Distr., iv. 1955 (A. D. Harrison). S. RHODESIA: 1 ♀, Salisbury, iii. 1900 (G. A. K. Marshall). TANGANYIKA: 5 ♂, 1 ♀, Matengo, Ugano, i. 1936 (Zerny). FRENCH CAMEROONS: 4 ♂, 1 ♀, Yaoundé, ix. 1952 (J. Rageau).

Chironomus (Chironomus) alluaudi Kieffer

Chironomus alluaudi Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1 : 19.

Yellowish-green, thoracic markings reddish-yellow, abdomen with dark spots on segments 1-5 or 6, cross-vein blackened, frontal tubercles present, pruinosity on thorax similar to *pulcher*, male front tarsi with slight beard. Female antennae with last segment equal to previous two together, male hypopygium with anal point straighter than in *pulcher*, style less strongly constricted and appendage 2 with more hair.

Male. Wing length 3.5 mm.

Head yellowish, mouthparts dark, A.R. about 3, pedicel brown, small frontal tubercles present. *Thorax* with greenish-yellow background; stripes, apex of postnotum and sternopleuron reddish-yellow; dorso-central bristles rather long, uniserial and pale; pruinosity well developed along lines of hairs, in prescutellar area, on shoulders and along lateral margins, with a distinct break between that on shoulders and that along dorso-central hair line. *Legs* yellow, tips of tarsal segments dark, anterior tibia and femur subequal, anterior tarsus with thin beard formed of long hairs, L.R. about 1.6. *Wings* with veins more or less seamed with light greyish, cross-vein dark, halteres yellow. *Abdomen* yellowish-green, segment 1 with trace of darkening, segments 2-5 or 6 with central dark spot, more or less extended laterally, apical segments darker. Hypopygium (Text-figs. 3, *b*, *k*) with anal point straighter in side view than *pulcher*, styles curved and not strongly constricted, appendage 2 with more numerous hairs.

Female resembles male, although abdomen may be darker in dried specimens. Segments 3-5 of antennae with well-formed necks, segment 6 equal to 4 and 5 together, sense bristles normal, not as long as in *pulcher*.

I have seen the type series of both sexes which is in Muséum National d'Histoire Naturelle, Paris (type locality, KENYA: Naivasha).

DISTRIBUTION. Apart from the type series, I have seen: KENYA: 6 ♂, 1 ♀, Nairobi, iv.1912 (*T. J. Anderson*).

Chironomus (Chironomus) satchelli sp. n.

A fairly large greenish species with reddish thoracic markings and black abdominal spots. Prothorax large, tarsal beard absent, thoracic pruinosity not well marked, female antennae with last segment equal to 3-5 together. Distinguished from *pulcher* and others by the more numerous hairs on appendage 2 of male hypopygium and from *alluaudi* by the wider styles and absence of tarsal beard.

Male. Wing length 4.5-5 mm.

Head green, frontal tubercles present, mouthparts darkened, pedicel reddish-yellow, A.R. about 3. *Thorax* green, stripes, apex of postnotum and sternopleuron reddish-yellow; pruinose on shoulders, lateral margins and along hair lines, but pruinosity much less developed than in *pulcher*; dorso-central hairs pale and uniserial; prothorax larger than in *pulcher*, more as in *scotti*. *Legs* yellowish-green, apices of tarsal segments darkened, L.R. 1.5, beard absent, anterior tibia slightly shorter than femur. *Wings* unmarked except for cross-vein which is slightly darkened, halteres pale or greenish. *Abdomen* green, segment 1 obscurely darkened, 2-6 with a large black spot usually extended laterally to the margins, apical segments more generally darkened. Hypopygium (Text-figs. 3, *c*, *l*) with styles strongly contracted at apex as in *pulcher*, anal point long and curved in side view, appendage 2 about as long as anal point and with about 20 hairs.

Female shows a general resemblance to male, although abdomen rather darker. Antennae with segment 6 equal to 3-5 together, sense hairs on 6 short and curved.

Holotype male and 2 ♀ paratypes, CAPE PROVINCE: Transkei, Kokstad, Mt. Currie, iii.1953 (*G. H. Satchell*). Further paratypes: CAPE PROVINCE: 1 ♂, Kirstenbosch, xii.1952 (*K. M. F. Scott*); 1 ♂, Grahamstown, ii.1953 (*G. H. Satchell*). TRANSVAAL: 1 ♂, 1 ♀, Tzaneen, Magoeba's Kloof, v.1953 (*G. H. Satchell*); 1 ♂, 1 ♀, Sabie-Pilgrims' Rest Road, ix.1954 (*A. D. Harrison*); 3 ♂, Waterval, Lydenburg District, iv.1955 (*A. D. Harrison*). UGANDA: 1 ♂, N. Bugishu, i.1930 (*H. Hargreaves*); 1 ♂, Kigezi Province, Mt. Sabinio, 10-11,000 ft., xi.1934 (*F. W. Edwards*). Three paratypes placed in South African Museum, holotype and remainder of paratypes in British Museum.

Chironomus (Chironomus) leucochlorus Kieffer

Chironomus leucochlorus Kieffer, 1923, *Ann. Soc. sci. Brux.* 42 (1) : 383.

In general appearance, colour and structure very similar to *satchelli* and *transvaalensis*. Southern African specimens may be pale but the Sudanese specimens are darker and well marked; distinguished from *satchelli* by smaller prothorax, structure of male hypopygium and female antennae, from *transvaalensis* by the hypopygial structure.

Male hypopygium (Text-figs. 3, *d*, *m*) with comparatively narrow styles, appendage 2 rather short and narrow, anal point broad and in side view deep at the base and

characteristically bent downwards, apex not curved. Female antennae with segment 6 hardly as long as 4 and 5 together.

I have seen the holotype male which is in South African Museum, Cape Town (type locality, Durban).

DISTRIBUTION. NATAL: Durban. S. RHODESIA: 1 ♂, 1 ♀, Salisbury, ii-iv.1900 (G. A. K. Marshall). BELGIAN CONGO: 1 ♂, Kalondo (Kivu), viii.1935 (H. Damas). SUDAN: 5 ♂, 1 ♀, Kelling, Jebel Marra, i.1954 (D. J. Lewis).

Chironomus (Chironomus) transvaalensis Kieffer

Chironomus transvaalensis Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1): 386.

? *Chironomus africanus* Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, **13**: 162.

Almost identical to *leucochlorus* except for male hypopygium in which the anal point is much more sharply downturned (Text-figs. 3, *e*, *n*), appendage 2 is also rather broader.

I have seen the type female which is in South African Museum, Cape Town (type locality TRANSVAAL: Maboki, Lydenburg). In this and in other specimens, especially females, the thoracic stripes are darkened near the centre of the thorax giving a slightly cross-banded appearance. The shape of the anal point seems to be quite constant over the whole range.

C. africanus was described from females from S. W. AFRICA: Rooibank; the type series is probably lost. It seems likely to be an earlier description of *transvaalensis* but it is not possible to be certain without either more collecting in the type locality or examination of the type series.

DISTRIBUTION. S. W. AFRICA: 1 ♂, Windhoek, i.1934 (K. Jordan). TRANSVAAL: 1 ♂, 1 ♀, Johannesburg, iii.1930 (B. de Meillon); 3 ♂, 6 ♀, Pretoria, ix.1954 (A. D. Harrison). S. RHODESIA: 3 ♂, 2 ♀, Salisbury, ii-iv.1956 (E. T. M. Reid). PORTUGUESE EAST AFRICA: 1 ♀, Beira, vi.1932 (A. Mackie). BELGIAN CONGO: 2 ♂, Elisabethville, xii.1938 (H. J. Brédo); 2 ♂, Maka Lualaba, i.1939 (H. J. Brédo); 8 ♂, 4 ♀, Musosa, x.1939 (H. J. Brédo); 3 ♂, Mabwe, Lac Upemba, viii.1947 (H. Damas); 10 ♂, Albertville, Lac Tanganyika, viii.1953 (J. Verbeke). SUDAN: 2 ♀, Juba, vi-vii.1954 (E. T. M. Reid). NIGERIA: 1 ♂, Zungeru, iii.1911 (J. W. S. Macfie). GOLD COAST: 4 ♂, Accra, vi-vii.1916 (J. W. S. Macfie); 1 ♀, Nangodi, Red Volta, x.1954 (G. Crisp).

Chironomus (Chironomus) caffrarius Kieffer

(? *Chironomus longicornis* Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, **13**: 160.)

(? *Chironomus apricus* Kieffer, 1908, *ibid.*: 162.)

Chironomus caffrarius Kieffer, 1914, *Ann. S. Afr. Mus.* **10**: 265.

Chironomus capensis Kieffer, 1914, *ibid.*: 266 (SYN. NOV.).

Chironomus brunneus Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 14 (nec Freeman, 1954).

Antennal ratio about 5, thorax with grey dusting over whole mesonotum except shoulders, tarsi with segments 2-5 blackish, anterior tarsi heavily bearded, male abdomen with large dark spots placed basally on the segments, anal point long, straight and downcurved.

This species is readily recognized because of the grey dusting and heavily bearded male front tarsi; both sexes may also be distinguished from others by the darkening of the tarsi, although it is very similar to *brunneus* in this respect. I have seen type specimens of both *cafrarius* and *capensis* which are in South African Museum; *capensis* was described from a rather more reddish specimen. As mentioned under *formosipennis*, a female specimen labelled as one of the type series of *capensis* bears no data label and is a specimen of *formosipennis*.

C. longicornis and *apricus* which were both described from females, may be earlier descriptions of this species, but it is not possible to be certain from the descriptions. The types appear to be lost, but further collecting in the type localities may produce material which will show the exact identity of the two species.

Male. Wing length 4.5–5.0 mm.

Head greenish or yellowish-brown, mouthparts darker, frontal tubercles present, pedicel and flagellum brown, A.R. high, between 4 and 5. *Thorax* grey dusted except on shoulders which are greenish; stripes, postnotum and sternopleuron either dark brown or reddish-brown, stripes easily visible through the dusting, intervening areas more yellowish; dorso-central hairs long, pale and uniserial, pronotum not unusually large. *Legs* yellowish-green, tarsal segments 2–5 blackish, especially in South African specimens; apical half of anterior basitarsus, segment 2 and basal half of segment 3 with strong beard; L.R. low, about 1.3 or 1.4. *Wings* unmarked except for cross-vein which is slightly darkened, halteres greenish. *Abdomen* yellowish-green with an interrupted longitudinal dark fascia, spreading laterally on each segment especially at the base of each. Hypopygium (Text-figs. 3, f, o) with styles not as sharply contracted as in some species, appendage 2 with numerous hairs, anal point long, straight and slightly bent down in side view.

Female quite similar to male, although abdomen more uniformly darkened at least in dried specimens, anterior tarsal beard absent. Antennae with segments 3–5 shorter and with shorter necks than *pulcher*, segment 6 equal to 3–5 together.

Type locality of *cafrarius*, Cape Town; of *capensis*, Dunbrody; of *longicornis*, S. W. AFRICA: Rooibank; of *apricus*, Namaqualand, Steinkopf and S. W. AFRICA: Rooibank.

DISTRIBUTION. It is a common species in South Africa and I have seen numerous specimens from localities in Cape Province, Orange Free State, Natal, Basutoland, S. W. Africa and Transvaal. Additional records are from BELGIAN CONGO: Series of both sexes, Parc National Albert, Lac Magera, ii–iii.1934 (*G. F. de Witte*). ETHIOPIA: 1 ♂, Dessie, xii.35–i.1936; 1 ♂, Waldia, ii.1936; 1 ♂, Addis Ababa, iv.1936 (all coll. *J. W. S. Macfie*); 1 ♀, Aba, vii.1953 (*M. Ovazza*).

Chironomus (Chironomus) brunneus Freeman

Chironomus brunneus Freeman, 1954, *Proc. R. Ent. Soc. Lond.* (B) 23: 18.

In structure, including the male hypopygium, this species is inseparable from *cafrarius*, except for the reduction of the male tarsal beard which is very sparse. It is darker in colour and lacks the grey dusting on the thorax. The thoracic markings are dark brown and the male abdomen almost entirely brown except for the pale

apices of the segments. Last antennal segment of female only equal to preceding two together.

Holotype male in British Museum, type locality CAPE PROVINCE: Kirstenbosch.

DISTRIBUTION. CAPE PROVINCE: Kirstenbosch, type series and other specimens; 2 ♂, Berg R., Assegaibos, xii.1952; 1 ♂, Tokai Forest Reserve, i.1952; 1 ♀, Tulbagh Barrage, x.1953 (all coll. *K. M. F. Scott*). Specimens from Belgian Congo identified by me as this species in 1955 are now seen to belong to *caffrarius*.

Chironomus (Chironomus) callichirus Kieffer

(? *Chironomus apicalis* Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, **13** : 162.)

Chironomus callichirus Kieffer, 1911, *Trans. Linn. Soc. Lond. (Zool.)* **14** : 352.

Chironomus seychelleanus Kieffer, 1911, *ibid.* : 356 (SYN. NOV.).

Chironomus albomarginatus Kieffer, 1924, *Ann. Soc. sci. Brux.* **43** (1) : 260; Freeman, 1955, *S. Afri. Animal Life*. Uppsala, **2** : 370 (SYN. NOV.).

Chironomus nivalis Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* **23** : 17; Freeman, 1955, *Explor. P.N.A.*, Miss. de Witte (1933-35), fasc. **83** : 13.

Thorax with brown markings and distinctive pruinose pattern, legs darkened at the knees, abdomen of male with large black spots.

The pruinose pattern of the thorax, especially the extra line on the lateral stripes, combined with the dark knees make this one of the more easily recognized of the African species. The single female type specimen in the British Museum of *callichirus* from Mahé, Seychelles is exactly similar to mainland specimens. *C. seychelleanus* was described from a mixed series, the female being *Chironomus (Dicrotendipes) binotatus* Kieffer; I now fix the male in the British Museum as lectotype. There is no real difference between this specimen and *callichirus* and it must fall as a synonym. I have seen the type of *albomarginatus* and it agrees perfectly with *callichirus*. *C. apicalis* was described from a male from Rooibank, S. W. Africa and the type is probably lost. The dark tips to the femora suggest that it is an earlier description of this species but it is not possible to be certain without either more collecting in the type locality or re-discovery of the type specimen.

Male. Wing length 3.5-4.0 mm.

Head yellowish, face darker, mouthparts brown, frontal tubercles well formed, pedicel brown, A.R. about 3. *Thorax* yellowish-green and pruinose, stripes, postnotum and sternopleuron reddish-brown; pruinosity highly characteristic, best viewed from the front: two anterior diagonal lines on shoulders, the lines of acrostichal and dorso-central bristles, a line dividing each lateral stripe longitudinally and a spot each side at the middle of the central stripe are all strongly pruinose. *Legs* yellowish-green, apices of tibiae and tarsal segments brown, knees brown or with a band just above and just below, sometimes basal third of anterior tibia dark; L.R. 1.5-1.75; tarsal beard absent. *Wings* with darkened cross-vein; halteres greenish. *Abdomen* greenish, segments 1-4 with dark markings; on 1 more or less transverse or even absent, on 2-4 as a median dark band occupying the basal three-quarters with lateral expansions to the margins, 5-8 more or less totally dark. Hypopygium (Text-figs. 3, *g*, *p*) with fairly narrow styles, appendage 2 with

about 12 hairs, anal point curved in side view, basal portion more or less parallel-sided.

Female with pruinose pattern similar to male, abdomen darker. Antennal segments 3-5 with necks as long as basal portions, segment 6 twice as long as 5, sensory hairs normal.

Holotype female of *callichirus* and lectotype male of *seychelleanus* both in British Museum (type localities, SEYCHELLES: Mahé); the female type of *albomarginatus* is in South African Museum (locality, "Cape"); holotype male of *nivalis* is in British Museum (locality, CAPE PROVINCE: Bergvliet).

DISTRIBUTION. Common and widely distributed in East and South Africa. I have records from Cape Province, Natal, S. W. Africa, Transvaal, S. Rhodesia, N. Rhodesia, Nyasaland, Tanganyika, Belgian Congo (Elisabethville and Parc National Albert), Kenya, Uganda, Sudan, Ethiopia, Seychelles, Madagascar (Tananarive and Perinet). In addition, I have seen: FRENCH WEST AFRICA: 1 ♂, 1 ♀, Haute Volta, Bobo Dioulasso, ix. 1956 (*J. Hamon*).

Chironomus (Chironomus) congolensis Goetghebuer

Chironomus congolensis Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 474.

A fairly small species, thorax pale with brown markings, pruinosity moderate, abdomen mostly dark in both sexes; anterior femur one and a half times as long as tibia, L.R. 2; male hypopygium not unlike *callichirus*. Distinguished from other species by short anterior tibia, unmarked wings, pale thorax and narrow styles.

Male. Wing length 2.5 mm.

Head yellowish, mouthparts darker, small frontal tubercles present, pedicel yellowish-brown, A.R. about 3.5. *Thorax* greenish-yellow; stripes, postnotum and sternopleuron light or dark brown, pruinosity present on shoulders and along lines of bristles but not particularly striking; dorso-central bristles more or less biserial. *Legs* yellowish, knees hardly darker, anterior femur one and a half times as long as tibia, L.R. 2, front legs about twice as long as entire insect. *Wings* clear, cross-vein only vaguely darkened, halteres pale. *Abdomen* may be yellowish with large dark spots occupying most of the segments or the spots may be so extended that abdomen appears dark with pale bands at the incisures. Hypopygium (Text-figs. 3, *h, q*) with narrow styles, appendage 2 carrying about 12 hairs, anal point evenly curved in side view.

Female resembles male, abdomen dark. Segments 3-5 of antenna with well-developed necks and whorls of long bristles, each about three times length of segment, segment 6 as long as 3-5 together.

I have seen the holotype male which is in Musée Royal du Congo Belge (locality, BELGIAN CONGO: Eala).

DISTRIBUTION. CAPE PROVINCE: 1 ♂, Ceres, iv. 1925 (*R. E. Turner*). NATAL: 1 ♂, Richard's Bay, vii. 1930 (*B. de Meillon*). ANGOLA: 1 ♂, San Salvador (*M. Gamble*). BELGIAN CONGO: 3 ♂, Elisabethville (*H. J. Brédo*); 1 ♂, Coquilhatville, x. 1910 (*A. Y. Massey*); 5 ♂, Eala (*J. Ghesquière*); 2 ♂, 2 ♀, Basoko, iv. 1948 (*P. L. G. Benoit*). KENYA: 1 ♂, Nairobi, iv. 1912 (*T. J. Anderson*). UGANDA:

3 ♂, Kampala, ix.1931 (*T. W. Chorley*); 3 ♂, Semliki Forest, viii.1952 (*D. S. Fletcher*). SUDAN: 1 ♂, Tonga, xi.1953 (*E. T. M. Reid*). NIGERIA: 5 ♂, 11 ♀, Onitsha (*D. Anderson*). DAHOMEY: 1 ♂, Kandi, vi.1954 (*J. Hamon*). GOLD COAST: 3 ♂, 2 ♀, Kumasi (*W. Smith*). HAUTE VOLTA: 1 ♂, Bobo Dioulasso, ix.1954 and 4 ♂, 7 ♀, ix.1956 (*J. Hamon*). SIERRA LEONE: 1 ♂, 1 ♀, Farangbaia, xi.1955 (*D. J. Lewis*).

Chironomus (Chironomus) linearis Kieffer

Chironomus linearis Kieffer, 1911, *Trans. Linn. Soc. Lond. (Zool.)* **14** : 353.

Chironomus leptogastrus Kieffer, 1911, *ibid.* : 354 (SYN. NOV.).

Chironomus (Calochironomus) rostratiforceps Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1) : 383 (SYN. NOV.).

Kieffer distinguished *linearis* and *leptogastrus* by the colour of the mesonotal stripes, whether they were reddish or dark brown and by the antennal ratio which was 2 or 3. Examination of type specimens in the British Museum has shown that these differences do not exist. The type of *rostratiforceps* has been borrowed from the South African Museum and has been found to belong to the same species.

The species is extremely similar to *congolensis* in colour and structure but may be distinguished by the dark apices of the femora and bases of the tibiae, especially the front tibiae which have the basal half dark. Leg proportions as in *congolensis*, A.R. about 3, male anal point in side view perhaps more parallel-sided basally (Text-figs. 3, *i*, *r*), segment 6 of female antenna shorter than 4 and 5 together. The pruinose bands along lines of dorso-central bristles often seem to be wider than in *congolensis*. The wing reflections mentioned by Kieffer under *rostratiforceps* do not differ from those of other species.

Type localities of *linearis* and *leptogastrus*, SEYCHELLES: Mahé; of *rostratiforceps* TRANSVAAL: Lydenburg.

DISTRIBUTION. TRANSVAAL: 3 ♂, 2 ♀, nr. Johannesburg, ix.1954 and iv.1955 (*A. D. Harrison*). S. RHODESIA: 1 ♂, Salisbury, iii.1900 (*G. A. K. Marshall*). SEYCHELLES : Mahé.

Chironomus (Chironomus) calipterus Kieffer

Chironomus calipterus Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, **13** : 158; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 371.

Chironomus tavetae Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* **1** : 15 (SYN. NOV.).

Calochironomus niliacus Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 70 (SYN. NOV.).

Calochironomus hexastictus Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924** : 292 (SYN. NOV.).

Structurally this species is very similar to *congolensis* but it is easily separated by the pale abdomen and well-developed grey clouds and seams on the wings; male also with slight tarsal beard.

The original descriptions of *calipterus*, *niliacus* and *hexastictus* leave no doubt about their identity although the types of all are lost. I have seen the type series of *tavetae* in Muséum National d'Histoire Naturelle, Paris, and can confirm that it belongs here.

Male. Wing length 2.5 mm.

Head yellowish-brown, mouth parts dark, pedicel reddish-brown, A.R. nearly 4, frontal tubercles present. *Thorax* greenish yellow with the mesonotal stripes, sternopleuron and apex of postnotum reddish or pale brown; lines of dorso-central bristles, prescutellar area and shoulders pruinose. *Legs* yellowish, apices of tarsal segments dark, knees indistinctly darkened, or femora with subapical dark ring; anterior femur longer than tibia, but only slightly so, L.R. about 1.8, anterior tarsus with slight beard. *Wings* with veins seamed with grey (Pl. 1, fig. *a*), two clouds in cell R_5 and one in M_2 , cross-vein blackened, halteres pale. *Abdomen* yellowish-brown and without distinct markings; hypopygium similar to *congolensis*.

Female. Rather darker than male but wing markings more distinct; antennae with segment 6 only one and a half times as long as 5.

Type locality of *calipterus* S. W. AFRICA: Rooibank; of *tavetae*, KENYA: Taveta of *niliacus* SUDAN: Shambe; of *hexastictus*, EGYPT: Maadi.

DISTRIBUTION. A very widespread species; the following records are additional to my previously published records from Cape Province, Transvaal, S. W. Africa and Kenya. BELGIAN CONGO: 1 ♀, Bambesa (*J. Vrydagh*). UGANDA: 1 ♀, Semliki Forest, viii.1952 (*D. S. Fletcher*). Sudan: 1 ♂, 2 ♀, Yirol, iii.1954 (*E. T. M. Reid*). DAHOMEY: 3 ♀, Porto Novo, xii.1954 (*J. Hamon*). GOLD COAST: 1 ♂, Accra, i.1920 (*A. Ingram*). HAUTE VOLTA: 1 ♀, Bobo Dioulasso (*J. Hamon*). SENEGAL: 2 ♂, Marsassoum, ix.1953 (*J. Hamon*). MADAGASCAR: 1 ♂, Perinet, xii.1955 (*B. Stuckenberg*).

Chironomus (Chironomus) acuminatus sp. n.

A plain green species with reddish thoracic markings; A.R. about 4, L.R. 1.75, prothorax of normal size. Distinguished from other similarly marked species mainly by the male hypopygium which has a structure quite unlike other species of the subgenus (Text-fig. 4, *a*). The style shape suggests that it belongs to the group *Camptochironomus* but the shape of the anal point and the presence of a well-formed appendage 1 preclude that. On external features it fits into *Chironomus* sensu stricto and I prefer to regard it as a distinctive species of that subgenus.

Male. Wing length 3 mm.

Head greenish, mouthparts yellowish-brown, frontal tubercles present, pedicel reddish, A.R. about 4. *Thorax* green and with hardly any pruinosity; mesonotal stripes, postnotum and sternopleuron reddish-yellow; dorso-central hairs pale and irregularly biserial. *Legs* yellowish, femora and tibiae rather greener, tarsal segments dark at apices, L.R. 1.75, anterior tarsi not bearded. *Wings* with slight darkening at cross-vein, halteres green. *Abdomen* plain green, unmarked; hypopygium (Text-figs. 4, *a*, *e*) very characteristic; style pointed, broad basally and with inner margin flattened; appendage 1 narrow and bare, appendage 2 long, well furnished with hair and with a long curved one at the apex; anal point deep in side view and flattened and broadened apically in dorsal view.

Female not known.

Holotype male, NIGERIA: Onitsha (*D. Anderson*) in British Museum.

Chironomus (Chironomus) formosipennis Kieffer

Chironomus formosipennis Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, **13** : 159.

Chironomus palustris Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* **1** : 16 ; Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* **23** : 18 (in subgenus *Calochironomus*) ; (SYN. NOV.).

Chironomus iricolor Kieffer, 1914, *Ann. S. Afr. Mus.* **10** : 264.

Calochironomus oxylabis Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 67 ; Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 467.

Calochironomus nilicola Kieffer, 1922, *ibid.* **91** : 70 (SYN. NOV.).

Calochironomus pictiventris Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1) : 382 (SYN. NOV.).

Calochironomus oxylabis var. *linea* Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924** : 291.

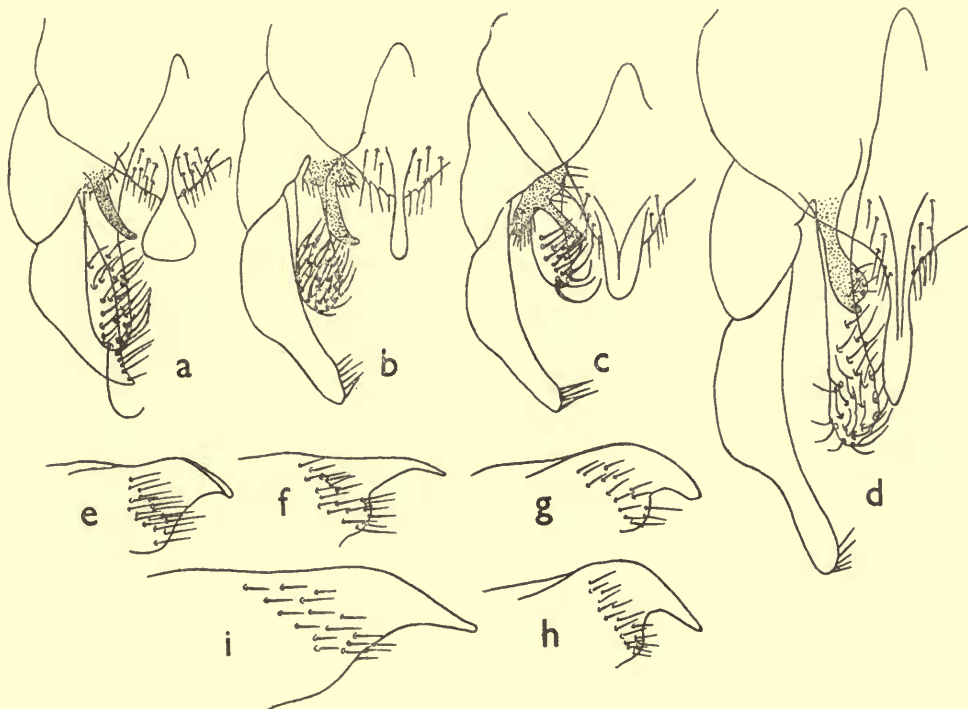


FIG. 4. Male hypopygia of *Chironomus* subg. *Chironomus* ; (a)–(d) in dorsal aspect, (e)–(i) anal point in lateral aspect. (a) *C. acuminatus* ; (b) *C. formosipennis* ; (c) *C. imicola* ; (d) *C. tetraleucus* ; (e) *C. acuminatus* ; (f) *C. formosipennis* ; (g) *C. imicola* ; (h) *C. seydeli* ; (i) *C. tetraleucus*.

I have not seen the type of *formosipennis* which is not in the Berlin Museum and is probably lost, but the description and the figure of the wing makes it certain that this is the species for which I have previously used the name *palustris*. Another possible synonym is *capensis* Kieffer *pro parte* (see under *caffrarius*), because there is a female of *formosipennis* in the South African Museum marked as a type specimen of *capensis*. The description of *capensis* mentions that the wings are hyaline, which may mean that the specimen was marked as a type in error ; it has no data label.

C. formosipennis is one of the most distinctive of the African species because of

the wing clouds, the oval or linear dark abdominal spots which are placed anteriorly on the segments and the heavily bearded male front tarsi.

Male. Wing length 3.5–5.5 mm.

Head brownish, palpi blackish, A.R. about 5, frontal tubercles present. *Thorax* with yellowish background; stripes, apex of postnotum and sternopleuron reddish, bristles pale and not very obvious, pale areas pruinose but not strikingly so. *Legs* yellow, last tarsal segment and sometimes apices of other segments dark, knees plain; well developed and strong beard present on apical half of anterior basitarsus and on second and third segments. *Wings* lightly clouded as in Pl. 1, fig. *b* of female, cross-vein darkened. *Abdomen* pale greenish-yellow with a central, narrow, interrupted, dark stripe, which is particularly obvious on segments 2–4, where it is usually expanded to form oval dark spots basally on each segment. Hypopygium (Text-figs. 4, *b*, *f*) with pubescent area at base of appendage 1 larger than usual, causing the species to be easily recognizable.

Female. Similar to male; abdominal markings less easily distinguishable, especially in dried specimens; wing markings darker, tarsal beard absent; antennal segments 3–5 with short necks, segment 6 slightly longer than 4 and 5 together, hairs on 6 numerous and short.

Type locality of *formosipennis* S. W. AFRICA: Rooibank. I have seen the type series of: *palustris* (Muséum National d'Histoire Naturelle, Paris, type locality KENYA: Naivasha); *iricolor* (South African Museum, type localities Cape Town and ORANGE FREE STATE: Smithfield); *pictiventris* (South African Museum, type locality Vryburg). *C. oxylabis* and *nilicola* were described from Sudan.

DISTRIBUTION. A common and widespread species in South, East and Central Africa and across to Nigeria and French Sudan, known to me from: Cape Province, Natal, Orange Free State, Transvaal, S. W. Africa, N. Rhodesia, Nyasaland, Belgian Congo (Lualaba R. and Parc National Albert), Uganda, Kenya, S. Sudan, Nigeria (Onitsha and Gadau), Haute Volta (Bobo Dioulasso), French Sudan (Macina). In addition I have a male from St. Helena Island, iv. 1954 (*J. R. MacIntyre*), and 3 ♂ from MADAGASCAR: Tananarive xii. 1955 (*B. Stuckenberg*).

Chironomus (Chironomus) imicola Kieffer

Chironomus imicola Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1 : 20.

? *Cryptochironomus fasciatus* Kieffer, 1923, *Ann. Soc. ent. France*, 92 : 164.

Chironomus palpalis Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* 25 : 197 (SYN. NOV.).

Chironomus reginae Goetghebuer, 1936, *Ibid.* 28 : 476 (SYN. NOV.).

The male is greenish with reddish-brown scutal stripes and dark spots on the abdomen, the femora are unmarked; the hypopygium is very characteristic with its broad anal point and narrow appendage 1 arising from a large basal pubescent pad. The female is a different-looking insect, darker in colour and with broad black bands occupying the apical third or more of the femora. The male hypopygium and the female femoral bands distinguish the species from all other African ones except *seydéli* which is a larger and bulkier insect with a slightly different anal point. It is similar to the Palearctic species *paganus* Meigen in male hypopygial structure

but is readily separated by colour and pattern; it falls into the group previously referred to as *Einfeldia*.

I have seen the type series of all species except *fasciatus* and am unable to see why Goetghebuer distinguished *reginae* from *palpalis*. From the description it seems likely that *fasciatus* belongs here.

Male. Wing length 3.0–3.5 mm.

Head brownish, palpi darker, frontal tubercles well developed, pedicel dark brown, A.R. about 4. *Thorax* greenish; stripes, apex of postnotum and sternopleuron reddish-brown, pale areas of scutum pruinose, bristles pale. *Legs* very pale green, tarsi almost white, extreme apices of tarsal segments darkened; L.R. 1.75, tarsal beard absent. *Wings* whitish, cross-vein darkened. *Abdomen* green, segments 2–5 each with a central rounded spot. Hypopygium (Text-figs. 4, c, g) quite different from any other African species except *seydeli*; appendage 1 with basal pubescent part enlarged and apical bare part smaller than usual, anal point very stout, down-curved and blunt-ended in side view.

Female differs from the male by being much darker in colour, the thoracic markings and the abdomen being largely dark brown, and by the presence of broad black rings occupying the apical third or half of the tibiae. In addition the anterior tibia is darkened on its basal half and the other tibiae may have sub-basal dark rings. Antennae with segment 6 about as long as 4 and 5 together.

Female cotypes of *imicola* in Muséum National d'Histoire Naturelle, Paris (type locality KENYA: Likoni, nr. Mombassa); holotype male and paratypes of both sexes of *palpalis* (locality BELGIAN CONGO: Katana, Kivu) and holotype female of *reginae* (locality BELGIAN CONGO: between Coquilhatville and Bumba) all in Musée Royal du Congo Belge. Type female of *fasciatus* is lost (locality SUDAN: Shambe).

DISTRIBUTION. It is a common, widespread and often abundant species, especially in tropical Africa. I have records from the following localities: TRANSVAAL: Letsitele River. S. RHODESIA: Salisbury. BELGIAN CONGO: Elisabethville, Eala, Stanleyville, Lake Edward, Kivu, Lake Albert. UGANDA: Lake Victoria. KENYA: Mombasa. SUDAN: Yirol, Khartoum. NIGERIA: Onitsha. DAHOMEY: Porto Novo. GOLD COAST: Accra, Kumasi, Obuasi. HAUTE VOLTA: Bobo Dioulasso. FRENCH SUDAN: Sikasso. SÉNÉGAL: Marsassoum.

Chironomus (Chironomus) seydeli Goetghebuer

Chironomus seydeli Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 477.

Chironomus rostrifer Freeman, 1955, *Explor. Parc Nat. Upemba* 1, Miss. de Witte, fasc. 35 (6) : 97 and *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83 : 15 (syn. nov.).

This species resembles a larger version of *imicola*. Wing length 5 mm., perhaps browner rather than green in general appearance, although there is still a good deal of green in the background. Structurally and in pattern exactly similar to *imicola* except for the anal point of the male which in side view (Text-fig. 4, h) is more sharply pointed and more downturned.

In his original description, Goetghebuer omitted the narrow part of appendage 1 both from his figure and from his description which led me to believe that *rostrifer* was different. Examination of his type has shown that the two are identical.

Holotype male of *seydeli* in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Bukama); holotype male of *rostrifer* in collection of Institut des Parcs Nationaux du Congo Belge (locality BELGIAN CONGO: Mabwe, Lac Upemba). It is probable that the smaller specimens referred to by me in 1955 from Parc National Albert are really *imicola*.

DISTRIBUTION. Known only from the type localities of Bukama and Mabwe which are about 70 miles apart.

Chironomus (Chironomus) tetraleucus Kieffer

(? *Chironomus schultzei* Kieffer, 1908, *Denkschr. Med.-Nat. Ges. Jena*, **13**:161).

Chironomus tetraleucus Kieffer, 1914, *Ann. S. Afr. Mus.* **10**: 263; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 15.

Chironomus biclavatus Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1): 384 (SYN. NOV.).

This is by far the largest African species of the subgenus and is easily recognized by its stout hairy legs, bearded male front tarsi, dark knees, high antennal and low leg ratios and unusually pruinose abdomen, apart from the distinctive features of the male hypopygium. It shows a superficial resemblance to *C. (Nilodorum) nigropunctatum*.

Chironomus schultzei may have been described from a mixed series of females of this species and males of some other but the type series is not to be found and it is impossible to be certain of its identity without either examination of this series or else a good deal of collecting in the type locality. I do not wish to use the name for this species until there is less doubt over its identity. I have seen type specimens of both of Kieffer's other two species and can confirm the synonymy.

Male. Wing length 5–7 mm., total body length may be 11 mm.

Head yellowish-brown, mouthparts brown, palpi rather short and with segments 2–4 subequal, frontal tubercles present, pedicel dark brown; antennae with dense brown plumes, A.R. more than 5. *Thorax* with grey pruinosity or dusting over the whole surface obscuring the pattern; stripes blackish and separate, background yellowish, dorso-central bristles pale, short for the size of the insect, multiserial; apex of postnotum and sternopleuron black beneath the dusting. *Legs* greenish-yellow, thicker than usual and with abundant soft hair especially on middle and posterior tibiae; knees, apices of tibiae and of tarsal segments slightly darkened; anterior tarsi with long and well-developed beard, L.R. 1.2. *Wings* darkened at the cross-vein, halteres pale. *Abdomen* black and covered with grey pruinosity, basal segment and apices of others rather paler; by moving insect in a strong light it is possible to break up pruinosity into four separate patches; abdominal hair dense and pale. Hypopygium (Text-figs. 4, *d*, *i*) with long and deep anal point; appendage 1 hairy and with a slight hook at apex, appendage 2 long and somewhat clubbed; styles often as shown, but variable and apical narrow portion may be much less strongly marked and shorter.

Female. Similar to male in general coloration and pattern; anterior tarsi without beard, antennae with segment 6 equal to 4 and 5 together.

Cotypes of *tetraleucus* (locality ORANGE FREE STATE: Smithfield) and holotype

male of *biclavatus* (locality S. RHODESIA: Salisbury) in South African Museum. Type locality of *schultzei* S. W. AFRICA: Rooibank, type series not in Berlin Museum and probably lost.

DISTRIBUTION. CAPE PROVINCE: 5 ♂, 6 ♀, Ceres, xi.1920-i.1921 (*R. E. Turner*); 1 ♂, Queenstown, i-ii.1923 (*R. E. Turner*); 1 ♀, Swellendam, xi.1923 (*R. E. Turner*); 2 ♂, 2 ♀, Deelfontein, iii.1902 (*Sloggett*). ORANGE FREE STATE: 3 ♂, 1 ♀, Harrismith, ii.1927 (*R. E. Turner*). NATAL: 2 ♂, 1 ♀, Drakensburg, xi.1926 (*R. E. Turner*). N. RHODESIA: 3 ♀, Lake Bangweulu, ix-xii.1946; 2 ♀, ix-x.1955 (*A. E. King*). BELGIAN CONGO: 2 ♀, Elisabethville, xi.1933 (*C. Seydl*); 8 ♂, 2 ♀, Kalondo, Kivu (*de Witte and Damas*). UGANDA: 5 ♂, Jinja, ii.1955 (*P. S. Corbet*).

Chironomus MEIGEN SUBGENUS *Halliella* KIEFFER

Halliella Kieffer, 1911, *Rec. Ind. Mus.* 6 : 172 ; Kieffer, 1918, *Ann. Mus. nat. Hung.* 16 : 63 ; Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 26 ; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924 : 303 ; Kruseman, 1949, *Bijdr. Dierk.* 28 : 252 ; Wülker, 1957, *Arch. Hydrobiol. Suppl.* 24 : 281. *Baeotendipes* Kieffer, 1913, *Rec. Ind. Mus.* 9 : 127 ; Kieffer, 1918, *Ann. Mus. nat. Hung.* 16, 74 ; Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 26 ; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924 : 279 (SYN. NOV.).

Male antennae 12-segmented and reduced in length, female antennae 6-segmented; frontal tubercles present; palpi very short, segments almost rounded. Prothorax collar-like and with a shallow central indentation; anterior tibia without spur, scale rounded, L.R. about 1, middle and posterior tibiae with rather narrow combs, each with a short spur, pulvilli present, but small in one species; wings milky, R_{2+3} separated from R_1 , posterior fork below cross-vein, squama fringed. Male hypopygium with appendages 1 and 2 well developed, styles rather pointed.

The subgenus shows some similarity to *Nilodorum* but the larger prothorax is sufficient to distinguish the two. There seems to be no reason for maintaining it as a separate genus because all the important characters are similar to those of *Chironomus*; it differs mainly in the reduction of mouthparts and male antennae. Where the larvae are known, they are associated with salt water (Wülker, 1957); the larva of the new species probably has a similar habitat.

Halliella and the type species *H. noctivaga* Kieffer were described from two males and six females captured by Annandale on a ship in the Suez Canal in October 1907. Two males and four females of this series are in the British Museum and enable me to say that it is the same species as Kieffer described under the name *H. brevimanus* from Tunis, because the antennal and palp differences mentioned by him do not exist, the descriptions of these parts given in 1911 being inaccurate.

Baeotendipes was based on material collected, again by Annandale, on a ship in the Suez Canal in October, but the year is not stated. The male hypopygium is similar to that of *H. noctivaga*, but Kieffer says that the male antenna is only 10-segmented and that the empodium is long. However, despite Kieffer's statement to the contrary, the empodium of *Halliella* is also long; in addition the antennal segments are difficult to count and were almost certainly incorrectly counted by Kieffer. The close resemblance of the hypopygium, the reduced antennae in the male and the short palpi make it certain that *Baeotendipes* is to be regarded as a

synonym of *Halliella* and that it was the same species with which Kieffer was dealing. In 1913 Kieffer incorrectly stated that *Halliella* was described from "Indes", and in 1921 that *Bacotendipes* was from "Indes Orientales".

The new species described below differs from the type species in the shortness of the pulvilli which are extremely large in *noctivaga*, but the general resemblance in all other characters is such that I have no hesitation in placing it in this subgenus.

KEY TO SPECIES OF *Chironomus* SUBG. *Halliella*

Anterior tarsi of male not bearded, pulvilli very large	<i>noctivaga</i> Kieffer
Anterior tarsi of male with well-developed beard, pulvilli short	<i>ovazzai</i> sp. n.

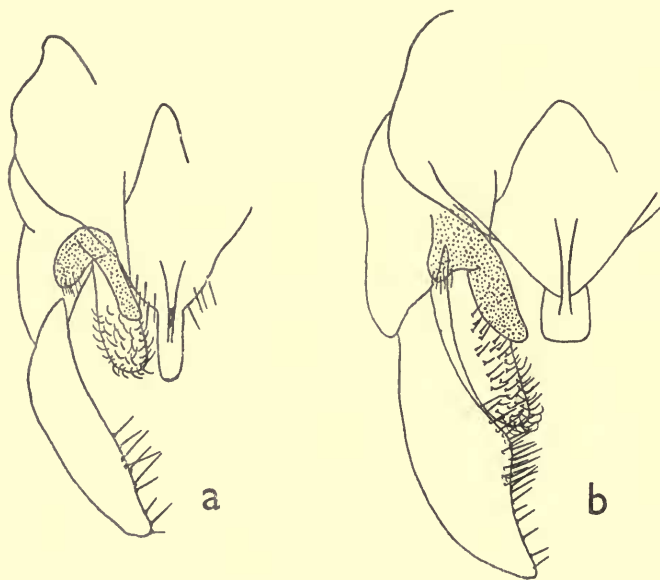


FIG. 5. Male hypopygia of *Chironomus* subg. *Halliella*. (a) *C. ovazzai*; (b) *C. noctivaga*.

***Chironomus (Halliella) ovazzai* sp. n.**

A greyish species, wings milky, legs yellowish or white, knees darker, anterior tibia of male well bearded; distinguished from *noctivaga* by the narrower styles and anal point and by the reduced pulvilli.

Male. Wing length 2.5 mm.

Head dark brown, palpi extremely short, segments hardly as long as wide, antennae short for the size of the insect, with 12 segments, fully plumed, A.R. about 3, frontal tubercles present. *Thorax* yellowish-brown with black mesonotal stripes, postnotum and sternopleuron, completely covered with grey pruinosity; prothorax collar-like and with a shallow central emargination. *Legs* yellowish and with whitish tarsi; apices of femora and bases of tibiae brown; front tibia without spur, L.R. hardly 1, tarsi with strong beard; four posterior tibiae with low combs each bearing a short

spur; pulvilli short but distinct. *Wings* milky, cross-vein slightly darkened, halteres pale. *Abdomen* blackish, some basal segments paler laterally, covered with grey pruinosity. Hypopygium (Text-fig. 5, *a*) with strong anal point, appendage 1 bilobed, the inner lobe longer and bare, styles narrower than in *noctivaga*.

Female similar in colour and general structure to male; antennae 6-segmented, whorl hairs short, not more than twice length of segments; segments 3-4 narrower apically but without distinct necks, segment 6 longer than 3-5 together.

Holotype male and paratype 1 ♀ ETHIOPIA: Assab, Salt Works, xi.1953 (*M. Ovazza*) in British Museum.

Chironomus (Halliella) noctivaga Kieffer

Halliella noctivaga Kieffer, 1911, *Rec. Ind. Mus.* 6 : 173.

Baeotendipes brevicornis Kieffer, 1913, *ibid.* 9 : 127 (SYN. NOV.).

Halliella brevimanus Kieffer, 1918, *Ann. Mus. nat. Hung.* 16 : 63 ; Kruseman, 1949, *Bijdr. Dierk.* 28 : 252 (SYN. NOV.).

Baeotendipes tibialis Kieffer, 1918, *Ann. Mus. nat. Hung.* 16 : 74 (SYN. NOV.).

Although this species has a Mediterranean distribution I am mentioning it here because, having seen type material of two of the above species, I am able to disentangle the rather confused situation surrounding the species.

As stated above, *noctivaga*, *brevicornis* and *brevimanus* are all clearly synonymous; *noctivaga* and *brevicornis* were both described from Suez, *brevimanus* from Tunis. I have been able to borrow the type of *B. tibialis*, a female from Ismailia, which is in the Hungarian National Museum, and have found it to be the same species again.

The species is readily recognizable because of the reduced male antennae, very short palpi, absence of tarsal beard, large pulvilli and stout male hypopygium (Text-fig. 5, *b*) which, though similar to *ovazzai* in some respects, is quite different in details of structure, especially shape of style and anal point.

All the material in the British Museum comes from the Suez Canal.

Chironomus MEIGEN SUBGENUS *Endochironomus* KIEFFER

Endochironomus Kieffer, 1918, *Ann. Mus. nat. Hung.* 16 : 69 ; Kieffer, 1921, *Ann. Soc. sci' Brux.* 40 : 273 ; Lenz, 1922, *Verh. int. Ver. Limnol. Kiel*, 1922 : 158 ; Goetghebuer, 1937,

in Lindner, *Flieg. Pal. Reg.* 3 (13c) : 9 ; Freeman, 1955, *Ann. Mus. Congo, Tervuren*, 36 : 288.

Chironomus subg. *Endochironomus* Edwards, 1929, *Trans. ent. Soc. Lond.* 77 : 393.

Demeijerea Kruseman, 1933, *Tijdschr. Ent.* 76 : 154 ; Goetghebuer, 1937, in Lindner, *Flieg. Pal. Reg.* 3 (13c) : 11 (SYN. NOV.).

Tanytarsus subg. *Endochironomus* Townes, 1945, *Amer. midl. Nat.* 34 : 64.

Glyptotendipes subg. *Demeijerea* Townes, 1945, *ibid.* 34 : 136.

Antennae typically 14-segmented in the male and 7-segmented in the female but they may be 12- and 7- or 12- and 6-segmented; frontal tubercles present or absent. Prothorax reaching up to front of mesonotum and typically bilobed but sometimes collar-like though without V-shaped emargination; anterior tibial scale sometimes with short spur (Text-fig. 2, *b*), posterior tibial combs usually each with a spur but they may be reduced or even quite absent; R₂₊₃ usually ending well beyond R₁. Male hypopygium with strong anal point and with both coxite append-

ages present, appendage 1 variable in shape, appendage 2 strongly formed and not bowed ventrally or racket-shaped, styles not strongly contracted apically.

There are five African species which fall fairly well within the limits of *Endochironomus* but none is completely typical. Edwards (1929) used the two-lobed pronotum as the most important character for the subgenus, but those African species which exhibit this feature well, differ either in the absence of posterior tibial spurs (*woodi*) or in the antennal segmentation. Kruseman (1933) erected the genus *Demeijerea* for a Palaearctic species (*rufipes* Linnaeus) with 12-segmented antennae in the male and it would be possible to carry this type of genus formation much further in the African fauna. It seems however, unwise to increase the number of genera or subgenera unnecessarily when by altering the definition slightly, these somewhat anomalous forms can be admitted.

I am following Edwards in treating the group as a subgenus of *Chironomus*. Kruseman and Goetghebuer treated both *Endochironomus* and *Demeijerea* as full genera, whilst Townes placed the former as a subgenus of *Tanytarsus* (= *Phaenopsectra* Kieffer) and the latter as a subgenus of *Glyptotendipes*, but the size of the prothorax seems to me to indicate a closer affinity with *Chironomus*.

Only one African species, *E. ituriensis* Goetghebuer has been described in this subgenus, but examination of the type shows it to be a re-description of *Nilodosia fusca* Kieffer (see under that genus). Goetghebuer described another species as *Glyptotendipes disparilis*, but the prothorax is too large in my opinion for it to be placed in that genus and, despite the antennal segmentation, it seems to be best placed in *Endochironomus*.

KEY TO THE AFRICAN SPECIES OF *Chironomus* SUBG. *Endochironomus*

1. Tarsi black and white; thorax and segment 6 of abdomen covered with silvery "bloom" type of pruinosity; tibial combs unarmed *woodi* sp. n.
Tarsi plain, brown or blackish; thorax not silvery; combs spurred 2
2. Male antennae with 14 segments, female with 7; pronotum collar-like 3
Male antennae with 12 segments, female with 6; pronotum bilobed 4
3. Legs black; appendage 1 of male hypopygium in two parts, 2a absent (Text-fig. 6, a)
acutistilus Freeman
Legs yellowish, appendage 1 hooked, 2a present (Text-fig. 6, b) *avicula* Freeman
4. Black, thoracic margins slightly brown *hamatus* sp. n.
Thorax green with red or dark brown stripes *disparilis* Goetghebuer

Chironomus (Endochironomus) acutistilus Freeman

Endochironomus acutistilus Freeman, 1955, *Ann. Mus. Congo, Tervuren, Zool.* 36 : 288.

A fairly large blackish species with pruinose thorax; male antenna with 14 segments, female with 7; frontal tubercles absent; prothorax collar-like; legs black, anterior tibia without spur, posterior tibiae with two spurs; male hypopygium with conical anal point, divided appendage 1 and pointed styles.

Male. Wing length 3.5 mm.

Head, mouthparts and pedicel blackish, flagellum and plumes more brown; A.R. about 2.6, antennae 14-segmented, frontal tubercles absent. *Thorax* blackish or

very dark brown, covered fairly uniformly but thinly with grey pruinosity; acrostichal bristles absent, dorso-centrals pale and uniserial; prothorax reaching well up to front of mesonotum, joined across as a narrow band without the well-defined knobs typical of the genus. *Legs* blackish-brown, paler only on the trochanters; anterior tibial scale rounded, A.R. about 1.4, tibia about three-quarters length of femur; middle and posterior tibiae with rather conical combs each with a short spur, pulvilli present. *Wings* without dark markings but yellowish basally; R_{2+3} well separated from R_1 ; halteres pale. *Abdomen* blackish-brown, pruinose and with dark bristles. Hypopygium (Text-fig. 6, *a*) quite characteristic; anal point long and conical, styles pointed; appendage 1 in two parts, a broad lower piece with 2 hairs at its inner apex and a narrow curved bare upper piece; appendage 2 broad and short.

Female similar to male; antennae with 7 segments, 3-6 with short necks, 7 nearly as long as 4-6 together.

Holotype male in British Museum, type locality BELGIAN CONGO: Elisabethville.

DISTRIBUTION. The following records are additional to previously published records from Ruanda, Uganda and Elisabethville. UGANDA: 4 ♂, 7 ♀, Jinja, ix-x. 1954 (*P. S. Corbet*). FRENCH WEST AFRICA: 1 ♂, Haute Volta, Bobo Dioulasso, i. 1953 and 1 ♂, ix. 1956 (*J. Hamon*). SIERRA LEONE: 2 ♀, Njala (*E. Hargreaves*). BELGIAN CONGO: 1 ♂, Katanga, Kafubu Mission, ix. 1931 (*A. Mackie*). RHODESIA: 2 ♀, Salisbury, iv. 1956 (*E. T. M. Reid*).

Chironomus (Endochironomus) avicula Freeman

Endochironomus avicula Freeman, 1955, *Ann. Mus. Congo, Tervuren, Zool.* 36 : 289.

Very similar to *acutistilus* in general appearance and structure, legs paler brown, femora almost yellow, anterior tibia darker than the others. Easily separated by the male hypopygium (Text-fig. 6, *b*) in which anal point is narrower, style long and narrow, appendage 1 of a characteristic shape, sometimes rather wider than shown in the figure, appendage 2a present, short and with a brush of fairly long hairs.

Holotype male in British Museum, type locality NIGERIA: Onitsha.

DISTRIBUTION. Apart from the type locality, paratypes were recorded from BELGIAN CONGO: Stanleyville and Léopoldville. There is one further record of FRENCH CAMEROONS: 3 ♂, Kribi, iii. 1953 (*J. P. Adam* and *J. Rageau*).

Chironomus (Endochironomus) disparilis Goetghebuer

? *Glyptotendipes disparilis* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 462.

Endochironomus disparilis Freeman, 1955, *Explor. Parc National Albert*, Miss. de Witte, fasc. 83 : 24.

Greenish, thorax shining, stripes reddish in the male and dark brown in female, abdomen with dark spots, male antenna with 12 segments, of female with 6, male anterior tarsus bearded, hypopygium characteristic.

In thoracic structure this species fits best into *Endochironomus* and the male hypopygium shows some resemblance to *acutistilus*, but the reduced antennal

segmentation and the proximity of R_1 and R_{2+3} afford a link with *Chironomus* sensu stricto. The antennal segmentation caused Goetghebuer to place it in *Glyptotendipes* from which it is precluded by the thoracic structure.

Male. Wing length 3–3.5 mm.

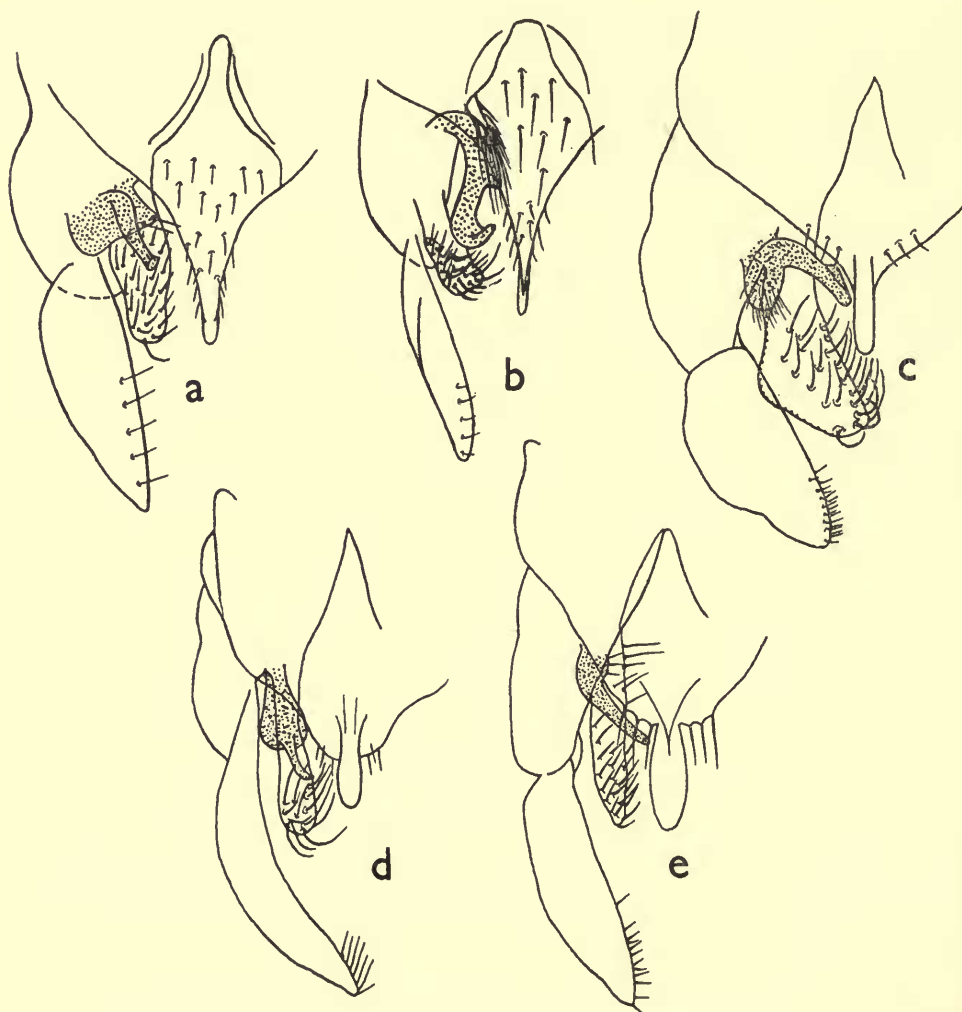


FIG. 6. Male hypopygia of *Chironomus* subg. *Endochironomus*. (a) *C. acutistilus*; (b) *C. avicula*; (c) *C. disparilis*; (d) *C. hamatus*; (e) *C. woodi*.

Head greenish-brown, palpi moderately developed, frontal tubercles just visible, antennae with 12 segments, A.R. about 4. *Thorax* yellowish-green, shining; stripes, postnotum and sternopleuron reddish; central stripes usually with a pair of small dark spots at their posterior extremities; acrostichal bristles present; prothorax bilobed and fairly typical of the subgenus. *Legs* yellowish-brown, knees and apices

of tibiae and of tarsal segments darker in some specimens; anterior tibiae with strong beard, L.R. about 1.5, anterior tibia without spur, posterior tibiae with combs not as strongly conical as in *acutistilus*, each with a spur. *Wings* plain, halteres greenish, R_{2+3} lying close to R_1 apically. *Abdomen* greenish, each segment with a large oval dark spot; hypopygium (Text-fig. 6, c) with short styles which are slightly contracted apically, appendage 1 with a transverse arm, 2 short and thick, anal point short.

Female differs from male in the darker thoracic markings which may be almost black, by the brown anterior tibia and by the darker abdomen; the central thoracic stripes may be joined to posterior border of thorax. Antennae with 6 segments, 3-5 with well formed necks, 6 hardly longer than 5; frontal tubercles small but distinct.

I have seen the holotype male in Musée Royal du Congo Belge.

DISTRIBUTION. Very abundant in the type locality BELGIAN CONGO: Parc National Albert, cratère Mugunga. I have also seen BELGIAN CONGO: 2 ♀, Lac Gando; 1 ♂ Ngoma, Lac Biuniu. S. W. AFRICA: 1 ♂, Windhoek, i. 1934 (*K. Jordan*).

Chironomus (Endochironomus) hamatus sp. n.

Blackish with some grey dusting; frontal tubercles well developed, male antenna with 12 segments, female with 6; prothorax divided centrally; appendage 1 of male hypopygium with a narrow apical hook, very similar to that of the Palaearctic species *C. (E.) intextus* Walker from which it may be separated by the reduced antennal segmentation, presence of frontal tubercles and narrow styles.

Male. Wing length 3.3 mm.

Head black, frontal tubercles well developed; antennae with 12 segments, A.R. about 3. *Thorax* black and with thin grey dusting; shoulders and lateral mesonotal margins brownish; pronotum divided centrally and more or less two-lobed; acrostichal bristles present. *Legs* dark brown, posterior 4 tibiae paler centrally; anterior tibia probably without spur but not clear on the specimens available; L.R. 1.5, tarsus slightly bearded, posterior tibial combs not strongly conical, each with a spur. *Wings* unmarked, yellowish basally, R_{2+3} well separated from R_1 , halteres pale. *Abdomen* black, slightly dusted, hairs pale; hypopygium (Text-fig. 6, d) with appendage 1 broad basally and with a narrow hook, similar to *C. (E.) intextus* Walker (Palaearctic Region), styles narrower.

Female not known.

Holotype male and paratypes 3 ♂, BELGIAN CONGO: Elisabethville, iii. 1939 (*H. J. Brédo*). One paratype in British Museum, holotype and remainder of series in Institut Royal des Sciences naturelles de Belgique.

Chironomus (Endochironomus) woodi sp. n.

A most distinctive black species, easily recognized by the silvery pruinosity on thorax and segment 6 of abdomen, and by the white markings on the tarsi. Male antenna 14-segmented, female 7-segmented, prothorax divided and with two lobes,

anterior tibia with a short spur, middle and posterior tibiae completely lacking spurs.

This species fits well very into *Endochironomus* except for the complete absence of posterior tibial spurs. However, there is a tendency among the Palaearctic species of the subgenus for a reduction of these spurs and I am therefore assuming the condition in *woodi* to be secondary reduction.

Male. Wing length 2.5 mm.

Head black, palpi a little shorter than usual, frontal tubercles absent, antennae with 14 segments, A.R. 1.8. *Thorax* black, mesonotum and pleura with silvery pruinosity which is so arranged that when viewed from the front the shoulders appear black; acrostichals well developed; prothorax strongly bilobed and quite typical for the subgenus. *Legs* very dark brown or blackish; posterior 4 femora with a broad brown ring near apex, anterior basitarsus pure white, other basitarsi also pure white but with a broad black ring about one-third of the length of the segment and placed near the middle, second and sometimes third segments of middle and posterior tarsi white, anterior tibia with short spur, posterior tibial combs narrow, more or less fused and quite lacking spurs. *Wings* very slightly smoky, veins brown, R_{2+3} with slight separation from R_1 at apex; halteres blackish. *Abdomen* black with black hairs; segment 6 with silvery pruinosity; hypopygium (Text-fig. 6, e) of rather simple form, appendage 1 slightly curved.

Female essentially similar to male in colour and pattern; antennae with 7 segments, 3-6 spindle-shaped, 7 nearly as long as 5 and 6 together.

Holotype male and paratypes 2 ♂, 3 ♀, NYASALAND: Ruo, iv. 1916 (R. C. Wood). Other paratypes: NYASALAND: 1 ♂, Ruo Valley, Chiromo, iv. 1910 (S. A. Neave). UGANDA: 1 ♂, Nakubidza (?), v. 1937 (G. L. R. Hancock). NIGERIA: 3 ♂, Zungeru, xi. 1910 (J. W. S. Macfie); 1 ♀, Onitsha (Anderson). FRENCH WEST AFRICA: Haute Volta, 4 ♂, nr. Bobo Dioulasso, ix. 1956 and 2 ♂, Nasso, iv. 1956 (J. Hamon). French West African specimens in collection of O.R.S.T.O.M., remainder of series in British Museum.

Chironomus MEIGEN SUBGENUS *Dicrotendipes* KIEFFER

Dicrotendipes Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1: 23; Kieffer, 1922, *Ann. Soc. ent. France*, 91: 63; Kieffer, 1924, *Ann. Soc. sci. Brux.* 43 (1): 256-260; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924: 297; Freeman, 1955, *Explor. Parc Nat. Albert. Miss. de Witte*, fasc. 83: 20.

Limnochironomus Kieffer, 1920, *Ann. Soc. sci. Brux.* 39 (1): 166.

Carteria Kieffer, 1921, *Philippine J. Sci.* 18: 590; Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 465 (SYN. NOV.).

Calochironomus Kieffer, 1921, *Ann. Soc. sci. Brux.* 40 (1): 274; Kieffer, 1922, *Ann. Soc. ent. France*, 91: 66; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924: 290.

Carteronica Strand, 1928, *Arch. Naturgesch.* 92: 48 (nom. nov. pro *Carteria* Kieffer).

Chironomus subgenus *Chironomus* Group C, Edwards, 1929, *Trans. ent. Soc. Lond.* 77: 386.

Chironomus subgenus *Limnochironomus* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 464; Goetghebuer, 1937, in Lindner, *Flieg. Pal. Reg.* 3 (13c): 19; Townes, 1945, *Amer. midl. Nat.* 34: 102.

Chironomus subgenus *Dicrotendipes* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 466; Goetghebuer, 1937, in Lindner, *Flieg. Pal. Reg.* 3 (13c): 31.

Chironomus sensu stricto Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 470 (in part).

Frontal tubercles usually absent or small, well developed in a few species only, palpi long; prothorax reaching up to front of thorax, but divided by a suture in the middle, closely applied to mesothorax and not collar-like; thorax rarely pruinose and then without silvery lines, often shining; wings sometimes with dark markings; male hypopygium with both appendages 1 and 2 present and fully developed. Subgenus most easily recognized by the male hypopygium; appendage 1 varies from species to species, but appendage 2 is always narrow at least basally, bowed ventrally and usually expanded distally with curved hairs at the apex, exact shape offers good specific characters; styles usually not sharply contracted at apices, with a few bristles along inner margin.

When Kieffer described *Dicrotendipes* he included only *D. pictipennis* (= *pilosimanus* 14-*punctatus*), an East African species with spotted wings which is automatically the type species of the genus. The sole character of the genus was the forking of appendage 2 of the male hypopygium. In a later described species, *D. cordatus* Kieffer, the wings are heavily marked but appendage 2 is only heart-shaped at the apex.

In the description of *Limnochironomus*, Kieffer stated that appendage 2 was long, narrow and strongly curved with the extremity enlarged and either simple or imperfectly bi- or trifold. The other characters mentioned, of proportions of pulvilli and spurs apply equally to *Dicrotendipes*. Kieffer has himself described a species of *Dicrotendipes* with plain wings (? Variety of a spotted winged species) and both genera include species with appendage 2 imperfectly divided at the apex. In thoracic structure, *Limnochironomus* species are identical with species of *Dicrotendipes* and as there is nothing left to separate them, it is necessary to treat *Limnochironomus* as a synonym of the earlier described *Dicrotendipes*.

Kieffer described *Calochironomus* in his key to the African genera (1921), separating it from other genera because appendage 2 was neither forked nor narrow and because the wings were spotted. However, out of six included species only one was known in the male sex, the type species, *C. fusconotatum* Kieffer being described from the female. His key bifurcates at couplet 32 into "males" and "females", all three genera, *Dicrotendipes*, *Calochironomus* and *Limnochironomus* appearing in the "male" section, but only *Calochironomus* in the "female" section, with the result that females of *Dicrotendipes* with spotted wings will only run down to *Calochironomus*. *Calochironomus fusconotatum* and two other species agree closely with species of *Dicrotendipes* and I am therefore forced to conclude that the two genera are synonymous. The single species of *Calochironomus* of which the male was known to Kieffer and on which the male characters of the genus were based is *C. oxylabis* Kieffer. This is quite unlike the other species and is a re-description of *Chironomus* (*C.*) *formosipennis* Kieffer.

Edwards (1929) recognized *Limnochironomus* only as a species group of his subgenus *Chironomus* sensu stricto. One of the principal characters of the subgenus *Chironomus* is the collar-like and undivided structure of the pronotum, but, in the Palaearctic species formerly placed in *Limnochironomus* and in the tropical African species of *Dicrotendipes*, the pronotum is more reduced and is divided by a suture, much as it is in *Cryptochironomus* and *Nilodorum*.

Carteria Kieffer (re-named *Carteronica* by Strand owing to its being preoccupied) was separated mainly on the shape of the styles of the male hypopygium. The females of the African species are similar to species of *Dicrotendipes*, their only peculiarity being the central black line on the thorax. Intermediate stages in the formation of this black line are shown by *D. nigrolineatus* sp. n. and *chloronotus* Kieffer, whilst the male of *D. crispus* sp. n. possesses curiously bent styles, which with its other characters place it in an intermediate position between *Carteria* and *Dicrotendipes*. *Carteria* and *Carteronica* must therefore fall as synonyms.

Table III details the African species placed by Kieffer in *Dicrotendipes* and *Calochironomus* and gives their position in this Study. In addition, the following species described by Kieffer are now placed in *Dicrotendipes*: (1911) *Chironomus binotatus*, *seychelleanus* and *chloronotus*; (1923, *Ann. Soc. ent. France*) *Chironomus niloticus*; (1923, *Ann. Soc. sci. Brux.*) *Chironomus latilobus*.

Table IV gives the species described by Goetghebuer in all genera which are correctly to be placed in *Dicrotendipes*.

The 18 species which I am treating as belonging to this subgenus show some variety in structure and colour and fall into groups on colour and male genital structure. In the group allied to *D. pilosimanus*, appendage 2 is usually strongly forked and the wings carry distinct and often strong markings. There is a group of green species with reddish mesonotal stripes and with hypopygium of the typical *Limnochironomus* form; *D. chambiensis* is typical of these species. A third group shows the *Carteria* type of markings and genital structure but is linked to the second by intermediates.

TABLE III.—*Species Described by Kieffer in Dicrotendipes and Calochironomus*

Date		Original name		Position in present study
1913	.	<i>Dicrotendipes pictipennis</i>	.	<i>Chironomus (Dicrotendipes) pilosimanus</i> 14-punctatus
1914	.	<i>D. pilosimanus</i>	.	<i>Ch. (D.) pilosimanus pilosimanus</i>
1922	.	<i>D. trilabis</i>	.	? <i>Ch. (D.) fusconotatus</i>
		<i>D. cordatus</i>	.	<i>Ch. (D.) cordatus</i>
		<i>D. leucolabis</i>	.	<i>Ch. (D.) leucolabis</i>
		<i>Calochironomus fusconotatum</i>	.	<i>Ch. (D.) fusconotatus</i>
		<i>Cal. oxylabis</i>	.	<i>Ch. (Chironomus) formosipennis</i>
		<i>Cal. griseonotatus</i>	.	<i>Ch. (D.) fusconotatus</i>
		<i>Cal. griseosparsus</i>	.	<i>Ch. (D.) fusconotatus</i>
		<i>Cal. niliacus</i>	.	<i>Ch. (Chironomus) calipterus</i>
		<i>Cal. nilicola</i>	.	<i>Ch. (Ch.) formosipennis</i>
1923	.	<i>Chironomus (Cal.) pictiventris</i>	.	<i>Ch. (Ch.) formosipennis</i>
		<i>Ch. (Cal.) rostratiforceps</i>	.	<i>Ch. (Ch.) linearis</i>
1924	.	<i>Dicrotendipes peringueyanus</i>	.	<i>Ch. (D.) peringueyanus</i>
1925	.	<i>Calochironomus oxylabis</i> var. <i>linea</i>	.	<i>Ch. (Ch.) formosipennis</i>
		<i>Cal. hexastictus</i>	.	<i>Ch. (Ch.) calipterus</i>
		<i>Cal. (?) nitididorsum</i>	}	<i>Chironomus sensu stricto</i> , probably Palaearctic species
		<i>Cal. nilophilus</i>		
		<i>Dicrotendipes forficula</i>	.	<i>Ch. (D.) fusconotatus</i>
		<i>D. speciosa</i>	.	<i>Ch. (D.) pilosimanus</i> 14-punctatus
		<i>D. nilicola</i>	.	<i>Ch. (D.) fusconotatus</i>

TABLE IV.—*Species of Dicotendipes Described by Goetghebuer*

Date	Original name	Position in present study
1934	<i>Paratendipes pictus</i>	<i>Chironomus (Dicotendipes) cordatus</i>
1936	<i>Chironomus (Limnochironomus) chambiensis</i>	<i>Ch. (D.) chambiensis</i>
	<i>Ch. (L.) schoutedeni</i>	<i>Ch. (D.) schoutedeni</i>
	<i>Ch. (Carteria) regalis</i>	<i>Ch. (D.) regalis</i>
	<i>Ch. (Dicotendipes) collarti</i>	<i>Ch. (D.) collarti</i>
	<i>Ch. (Chironomus) bredoi</i>	<i>Ch. (D.) bredoi</i>
	<i>Ch. (Ch.) henwardi</i>	<i>Ch. (D.) chloronotus</i>
	<i>Polypedilum (?) aequatoris</i>	<i>Ch. (D.) leucolabis</i>
	<i>P. griseovittatum</i>	<i>Ch. (D.) peringueyanus</i>
	<i>P. 14-punctatum</i>	<i>Ch. (D.) pilosimanus 14-punctatus</i>
	<i>P. 4-punctatum</i>	<i>Ch. (D.) fusconotatus</i>

KEY TO AFRICAN SPECIES OF *Chironomus* SUBG. *Dicotendipes*

1. Wings with dark clouds, spots or bands 2
Wings without dark markings 9
2. Wings with spots or clouds (Pl. 1, figs. *c-f*) 3
Wings with broad blackish cross-bands (Pl. 1, figs. *g-i*) 7
3. Wing pattern formed of clouds and seams along the veins (Pl. 1, fig. *f*) . . . *sudanicus* sp. n.
Wing pattern including spots in the cells (Pl. 1, figs. *c-e*) 4
4. Anterior femora darkened apically, other knees quite pale and unmarked; thorax greenish with reddish stripes, dorso-central bristles uniserial, their pits pale . . . 5
All knees blackened; thorax grey, stripes dark brown, dorso-centrals bi- or triserial, their pits pale or darkened 6
5. Anterior tarsi of male strongly bearded *pilosimanus pilosimanus* Kieffer
Anterior tarsi of male without beard *pilosimanus 14-punctatus* Goetghebuer
6. Posterior fork cell usually with a central dark spot, when absent in teneral specimens then fork veins hardly darkened (Pl. 1, fig. *d*) *fusconotatus* Kieffer
Posterior fork cell without central spot, fork veins strongly clouded (Pl. 1, fig. *e*) . . . *peringueyanus* Kieffer
7. Wing band occupying apical half of R_{2+3} and extended beyond, base of cell R_5 quite clear; abdominal segments yellow with brown basal bands *leucolabis* Kieffer
Wing band occupying basal portion of R_{2+3} and filling base of cell R_5 (Pl. 1, figs. *g, h, i*), abdomen completely black except sometimes for the male hypopygium . . . 8
8. Appendage 1 of male hypopygium broadened before apex, appendage 2 slightly bilobed (Text-fig. 7, *c*); wing markings more extensive (Pl. 1, figs. *g, h*) . . . *cordatus* Kieffer
Appendage 1 of a more uniform width, appendage 2 with apical branch (Text-fig. 7, *d*); wing markings less extensive (Pl. 1, fig. *i*) *collarti* Goetghebuer
9. Thorax green or yellow with reddish or brown stripes 10
Thorax in most specimens with the central stripe overlaid with an extra dark brown or blackish stripe, in some specimens all 3 stripes similarly overlaid or only lateral ones, occasional specimens of *chloronotus* have thorax plain and can only be identified from male hypopygium 15
10. Ninth tergite of male appearing trifid, appendage 3 very narrow (Text-fig. 7, *h*) . . . *bredoi* Goetghebuer
Ninth tergite not appearing trifid, appendage 2 wider at apex 11
11. Anal point of male broad and strongly downturned 12
Anal point narrow and less strongly downturned 13

12. Male hypopygium as in Text-fig. 7, *g, n* *kribiicola* Kieffer
 Male hypopygium as in Text-fig. 7, *i, o* *ealae* sp. n.
13. Appendage 2 of hypopygium large and racket-shaped (Text-fig. 7, *j*)
schoutedeni Goetghebuer
 Appendage 2 narrower 14
14. Anal point narrow in lateral view and strongly curved, appendage 2 less swollen at apex (Text-figs. 7, *e, l*) *binotatus* Kieffer
 Anal point wider in lateral view, appendage 2 more swollen at apex (Text-figs. 7, *f, m*) *chambiensis* Goetghebuer
15. Central thoracic dark stripe short, not longer than the underlying reddish stripe, or even absent (some *chloronotus*), male styles normal 16
 Central thoracic dark stripe prolonged backwards over scutellum and postnotum, male styles either subovate or bent 17
16. Appendage 1 of male hypopygium broad (Text-fig. 7, *k*) *nigrolineatus* sp. n.
 Appendage 1 elongated (Text-figs. 8, *a-c*) *chloronotus* Kieffer
17. Inner comb of posterior tibia with 4 or 5 spurs *multispinosus* sp. n.
 Inner comb of posterior tibia with normal single spur 18
18. Leg ratio less than 2, appendage 1 of male hypopygium short and without hair brush at base, appendage 2 not swollen subapically (Text-fig. 8, *f, l*) *penicillatus* sp. n.
 Leg ratio 2 or more, either hair brush present at base of appendage 1 or that appendage elongate, appendage 2 swollen subapically 19
19. Male style sharply bent, appendage 1 long and narrow (Text-fig. 8, *g*) *crispi* sp. n.
 Male style broad, not bent, appendage 1 short and wide (Text-fig. 8, *d*)
regalis Goetghebuer

Chironomus (Dicrotendipes) pilosimanus Kieffer

Dicrotendipes pilosimanus Kieffer, 1914, *Ann. S. Afr. Mus.* **10** : 262 ; Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* **23** : 19 ; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 372.

Wings spotted, frontal tubercles large, thorax greenish and pruinose between the stripes which are conspicuous and reddish or brownish, abdomen greenish with darker central markings; IXth tergite of male with broad membranous expansion, appendage 2 branched, smaller branch at right angles and well removed from apex. Easily distinguished from *fusconotatus* by absence of pruinosity on stripes which are redder and by apex of only anterior femora being dark, other knees pale; separated from this and from subsp. *quatuordecimpunctatum* by presence of strong tarsal beard, although intermediates between the two subspecies are to be found in Transvaal.

There is an earlier name for this species, namely *pictipennis* Kieffer which is applicable to its subspecies (see below). However, with the use of *Dicrotendipes* as a subgenus only, this name is preoccupied and the species must take the later name *pilosimanus*, whilst the subspecies carries the only available later name *quatuordecimpunctatum*.

Male. Wing length 1.8–3.5 mm.

Head brown or brownish-yellow, mouthparts darker, pedicel brown, flagellum paler, A.R. about 3.5, frontal tubercles large and conspicuous. *Thorax* green or yellowish with whitish pruinosity on shoulders, lateral margins and prescutellar area; mesonotal stripes usually reddish-brown, partially darkened along margins and more or less fused across in the centre of the thorax, but in some specimens stripes darker brown; postnotum and sternopleuron usually darker than stripes even

in paler specimens; dorso-central bristles uniserial, their pits not darkened. *Legs* pale yellowish-green, apex of anterior femur and apices of all tibiae blackish, knees of posterior 4 legs unmarked; anterior tarsi with apices of first and second segments darkened, segments 3-5 completely dark, tarsi of other legs with apices of segments 1-3 dark and 4-5 totally dark; anterior tarsi strongly bearded, tibial spurs distinct and well formed, L.R. 1.5, anterior femur about one and a quarter times length of tibia. *Wings* with 7 dark spots arranged as in Pl. 1, fig. c of female; halteres pale. *Abdomen* greenish, in most specimens with indications of brown markings centrally on segments 2-5, apex more generally dark in dried specimens; incisures pruinose, apex also pruinose. Hypopygium (Text-fig. 7, a) with branched appendage 2; the branch is at right angles and removed from the apex; appendage 1 evenly curved; styles slightly contracted apically, rather more curved than in *fuscnotatus*; anal point downcurved, IXth tergite with broad membranous extension beneath anal point.

Female quite similar to male in colour and pattern, wing markings usually darker and occasionally with an additional black streak below Cu; abdomen more uniformly darkened; antennae with segment 6 equal to 4 and 5 together.

I have seen specimens from the type series which is in South African Museum (type locality, Cape Town).

DISTRIBUTION. CAPE PROVINCE: 4 ♀, Deelfontein, ii.1902 (*Sloggett*); 1 ♂, 1 ♀, Mossel Bay (*R. E. Turner*); 2 ♂ Ceres, iii.1925 (*R. E. Turner*); long series from Bergvliet, Rondebosch, Wellington (*K. M. F. Scott*). ORANGE FREE STATE: 2 ♀, Harrismith, ii.1927 (*R. E. Turner*). NATAL: 1 ♂, Estcourt, ix.1896 (*G. A. K. Marshall*); 1 ♀, Weenen, ix.1928 (*H. P. Thomasset*). TRANSVAAL: series including intermediates, Olifantsvlei, nr. Johannesburg, ix.1954 (*A. D. Harrison*); 4 ♂, 3 ♀, Pretoria, vi-ix.1954 (*A. D. Harrison*). Additional records from these provinces and from Basutoland, Bechuanaland and S.W. Africa are given in my 1955 paper.

Chironomus (Dicrotendipes) pilosimanus

subsp. *quatuordecimpunctatus* Goetghebuer

Dicrotendipes pictipennis Kieffer, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1: 23; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83: 22 (not *Chironomus pictipennis* Philippi, 1865, *Verh. Zool. Bot. Ges. Wien*, 15: 600).

Dicrotendipes speciosus Kieffer, 1924, *Ann. Soc. sci. Brux.* 43 (1): 256; Kieffer, 1925, *Ann. Soc. R. ent. Égypte*, 1924: 299 (not *Chironomus speciosus* Kieffer, 1911, *Rec. Ind. Mus.* 6: 133).

Polypedilum quatuordecimpunctatum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 48.

Dicranotendipes speciosus Kruseman, 1949, *Bijdr. Dierkunde*, 28: 254 (laps. cal.).

Very similar to typical subspecies in colour and general structure including hypopygium but differing in the absence of tarsal beard. A series taken in Transvaal near Johannesburg shows specimens with a short beard which is present only on segments 2-3 of the tarsus. The presence of these intermediates suggests that the two are geographical subspecies, *pilosimanus* being the South African representative and the present one the East and Central African. In size, *quatuordecimpunctatus* is often on the average smaller and the pattern may be less strongly marked. Occa-

sional specimens are to be found with reduced wing spots but these are probably teneral.

It is unfortunate that with the use of *Dicrotendipes* as a subgenus, the earlier names become homonyms, so that it is necessary to use the name proposed by Goetghebuer. I was in error in 1955 in giving *Calochironomus griseonotatus* Kieffer and *nilicola* Kieffer as synonyms of this species; the first is really a synonym of *Chironomus* (*Dicrotendipes*) *fusconotatus* Kieffer and the other a synonym of *Chironomus* (*Chironomus*) *formosipennis* Kieffer.

I have seen the type series of *pictipennis* in Muséum National d'Histoire Naturelle, Paris (type locality KENYA: Naivasha). The holotype female of *Polypedilum quatuordecimpunctatum* is in Musée Royal du Congo Belge where I have seen it (locality KENYA: Nakuru) and I can confirm that the posterior tibia has two spurs and that the species belongs here. The type of *speciosus* appears to be lost (locality ALGERIA: Alger).

DISTRIBUTION. EGYPT: 1 ♀, Moascar, iii.1942 (J. W. S. Macfie). SUDAN: 3 ♂, 2 ♀, Kurra, N. Jebel Marra, vii.1932 (M. Steele). YEMEN: 2 ♂, San'a, x.1937 (C. Rathjens). ETHIOPIA: 2 ♀, Dessie, xii.1935 (J. W. S. Macfie). UGANDA: 9 ♂, 3 ♀, Lake Victoria, vi.1950 (W. W. Macdonald). KENYA: 1 ♂, 1 ♀, Naivasha, v.1918 and 1 ♂, Kabete, iv.1911 (T. J. Anderson). BELGIAN CONGO: long series from Parc National Albert; 7 ♂, 1 ♀, Elisabethville, xi.1933 (C. Seydel). N. RHODESIA: 2 ♀, Lusaka, ix.1955 (A. E. King). S. RHODESIA: 5 ♂, 14 ♀, Salisbury (E. T. M. Reid). TRANSVAAL: Series intermediate between *pictipennis* and *pilosimanus*, Olifantsvlei, nr. Johannesburg, ix.1954 (A. D. Harrison).

Chironomus (*Dicrotendipes*) *fusconotatus* Kieffer

(? *Dicrotendipes trilabis* Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 63).

Calochironomus fusconotatus Kieffer, 1922, *ibid.* **91** : 68.

Calochironomus griseonotatus Kieffer, 1922, *ibid.* **91** : 69.

Calochironomus griseosparsus Kieffer, 1922, *ibid.* **91** : 69.

Dicrotendipes forficula Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924** : 298.

Dicrotendipes nilicola Kieffer, 1925, *ibid.* **1924** : 300 (SYN. NOV.).

Polypedilum quatuordecimpunctatum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 489 (SYN. NOV.).

C. fusconotatus, *griseonotatus*, *griseosparsus* and *D. nilicola* were all described from females and seem to be re-descriptions of the same species, which was later more fully dealt with under the name *D. forficula*. *D. trilabis* is structurally identical and was described from the male, it differs from the others by the legs and wings being unmarked. I have seen teneral specimens from other parts of Africa with wing spots nearly absent and it seems likely that Kieffer had such a specimen before him but I am not adopting page precedence because there is some doubt over its identity; I am therefore treating *trilabis* as a probable synonym of *fusconotatus*. I have seen the type of *P. quatuordecimpunctatum* and can confirm that it is a teneral specimen of this species with only two of the dark spots developed on each wing; the posterior tibia has two spurs.

Wings spotted, all knees blackened, thorax with fairly heavy grey pruinosity which often masks the stripes; dorso-central bristles bi- or triserial; male hypo-

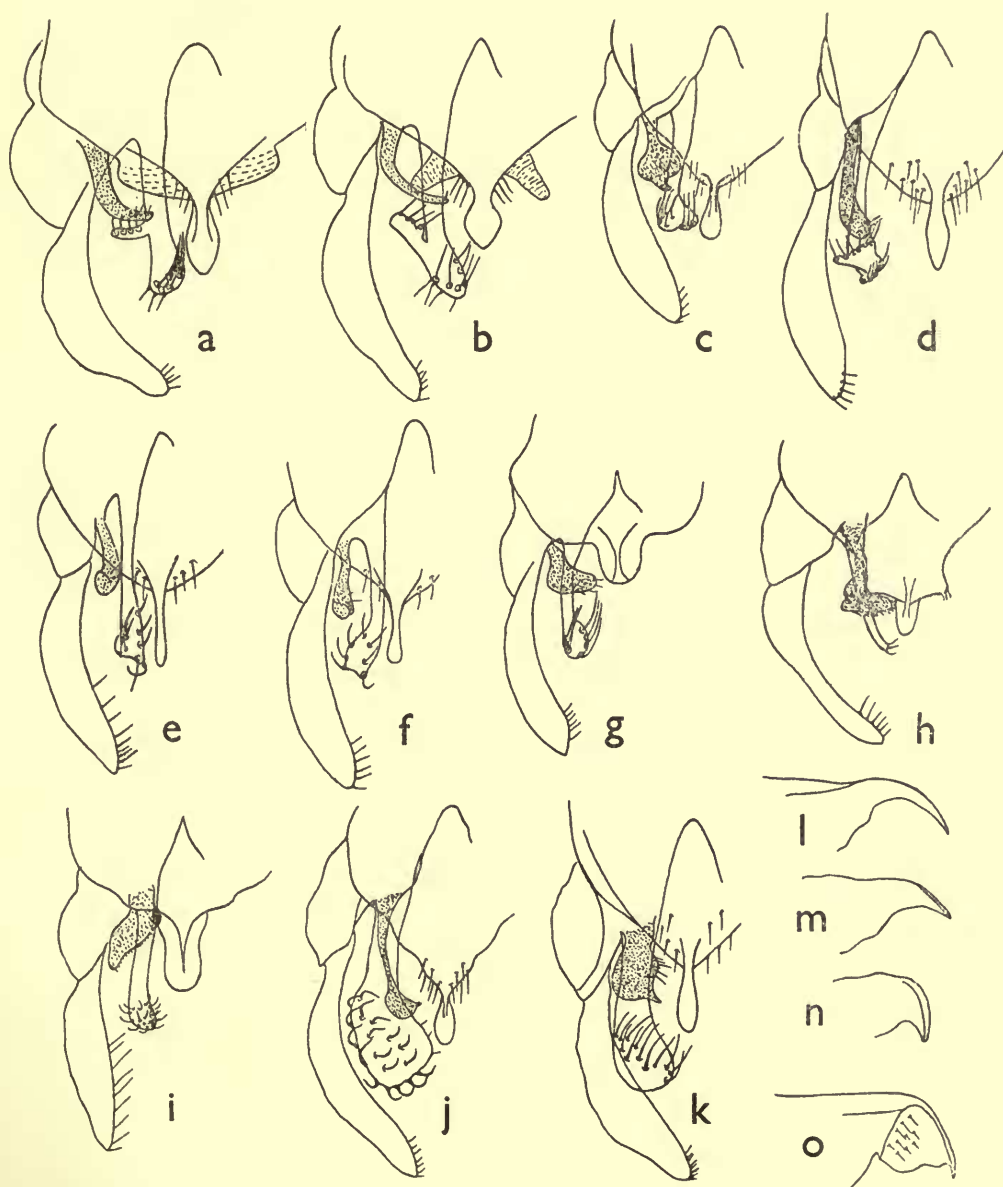


FIG. 7. Male hypopygia of *Chironomus* subg. *Dicrotendipes*; (a)–(k) in dorsal aspect, (l)–(o) anal point in lateral aspect. (a) *C. pilosimanus*; (b) *C. fusconotatus*; (c) *C. cordatus*; (d) *C. collarti*; (e) *C. binotatus*; (f) *C. chambiensis*; (g) *C. kribiicola*; (h) *C. bredoi*; (i) *C. ealae*; (j) *C. schoutedeni*; (k) *C. nigrolineatus*; (l) *C. binotatus*; (m) *C. chambiensis*; (n) *C. kribiicola*; (o) *C. ealae*.

pygium with a membranous appendage on each side of the anal point, appendage 2 branched, the branch more apical than in *pilosimanus* and directed forwards. These characters separate it from *pilosimanus* but from *peringueyanus* it can only be separated by the presence of a spot in the fork cell (sometimes absent in teneral specimens) and by the less darkened fork veins; distinguished from *sudanicus* by the different wing pattern.

Male. Wing length 2.2-3 mm.

Head greyish-brown, palpi darker, frontal tubercles present, pedicel pruinose, A.R. about 3.5, plumes pale. *Thorax* with fairly strong grey pruinosity, often obscuring the stripes and postnotal and sternopleural markings which are dark brown; dorso-central bristles bi- or triserial at least posteriorly, pits darkened. *Legs* yellowish-green, all femora black tipped, all tibiae with black sub-basal ring and blackened at apex; anterior basitarsus and first 2 or 3 tarsal segments of other legs dark at apices, remainder of tarsal segments completely dark; anterior tarsi with slight beard on segments 2-3 in some specimens. *Wings* (Pl. 1, fig. d) normally with pattern of spots very similar to *pilosimanus* but main spot in centre of cell R_5 less clearly double, anal cell with one dark spot and two superposed lighter ones, posterior fork and Cu clouded. Specimens are often found with some or all of spots greatly reduced or even absent; *trilabis* has probably and *quatuor punctatum* certainly, been described from such specimens. Halteres pale. *Abdomen* greenish, each segment with a central darkened area; hypopygium (Text-fig. 7, b) resembles that of *pilosimanus* but easily distinguished by a pair of membranous processes lateral to anal point; appendage 2 with branch forwardly projecting and arising nearer the apex, style less strongly curved.

Female resembles male in colour and pattern, abdomen rather darker. Antennae short, intermediate segments fusiform and without long necks, segment 6 equal to 4 and 5 together.

Type series of all species listed probably lost with exception of *quatuor punctatum* which is in Musée Royal du Congo Belge (locality BELGIAN CONGO: Vitshumbi). Type locality of *trilabis* and *griseonotatus* SUDAN: south of Khartoum; of *fusconotatus* and *griseosparsus* SUDAN: between Wad el Zaki and Shabasha Shary; of *forficula* and *nilicola* EGYPT: Maadi.

DISTRIBUTION. I have seen numerous specimens from SUDAN: Khartoum and Wad Medani (*D. J. Lewis*) and near Assuan (*S. Hirst*) and from BELGIAN CONGO: Parc National Albert (*de Witte*, *Damas* and *Verbeke*). My only other record is UGANDA: Jinja (*Corbet* and *Macdonald*), but the species is probably common throughout East and Central Africa.

Chironomus (Dicrotendipes) peringueyanus Kieffer

Dicrotendipes peringueyanus Kieffer, 1924, *Ann. Soc. sci. Brux.* 43 (1): 257; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, 2: 372.

Polypedilum griseovittatum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 485 (syn. nov.).

In structure, including hypopygium, and general body colour indistinguishable from *fusconotatus*, only to be separated by the arrangement of the wing spots

(Pl. 1, fig. e) there being no spot in the fork cell whilst the fork veins are strongly clouded. The wing spots are slightly paler than in *fusconotatus* but the body colour is fully as dark; it may only be a variety of that species.

I have seen cotypes of *peringueyanus* from the South African Museum (locality CAPE PROVINCE: De Aar). I have also been able to study the holotype female of *Polypedilum griseovittatum* in the Musée Royal du Congo Belge (type locality BELGIAN CONGO: Parc National Albert); I can confirm that this has two spurs on the tibiae and belongs here and not to *Polypedilum*.

DISTRIBUTION. The following records are additional to previously published records from Cape Province, Orange Free State and Bechuanaland. N. RHODESIA: 1 ♀, Lusaka, ix-x.1955 (A. E. King). BELGIAN CONGO: 1 ♂, Kivu, Goma, x.1953 (J. Verbeke). KENYA: 1 ♀, Kisumu, in aeroplane, iii.1936 (C. B. Symes).

Chironomus (Dicrotendipes) sudanicus sp. n.

A small species with male hypopygium identical with that of *fusconotatus*. Separable from *pilosimanus*, *fusconotatus* and *peringueyanus* by the wing markings being over and along the veins and not as spots in the cells.

Male. Wing length 1.7 mm.

Head brown, palpi darker, frontal tubercles very small, A.R. about 2.5. *Thorax* similar in colour to *fusconotatus* but pruinosity on shoulders and prescutellar area more silvery and brighter, dorso-central bristles uniserial. *Legs* yellow; apex of anterior femur, base of anterior tibia and apices of all tibiae darkened, although darkening often quite faint; tarsi obscurely darkened towards apices of segments and in some specimens posterior femora obscurely darkened at apices; L.R. 1.75. *Wings* (Pl. 1, fig. f) with paler pattern than in previous species, no discrete spots in cells but clouds present over cross-vein, posterior fork and Cu and in anal angle; anal angle reduced in female but not in male. *Abdomen* almost completely dark with pale rings at the incisures, hypopygium similar to that of *fusconotatus*.

Female. Very similar to male, antennae of all specimens broken.

Holotype male, SUDAN: Adok; paratypes, SUDAN: 7 ♀, Melut; 2 ♀, Tonga; 1 ♀, Shambe (all coll. E. T. M. Reid, xi.1953); 1 ♂, Liednum nr. Wau, iii-iv.1955 (E. T. M. Reid); all specimens in British Museum. In addition, some specimens taken by J. Verbeke at Albertville, Lake Tanganyika, may belong here but they are larger and have black femora.

Chironomus (Dicrotendipes) cordatus Kieffer

Dicrotendipes cordatus Kieffer, 1922, *Ann. Soc. ent. France*, 91: 64; Freeman, 1955, *Explor.*

Parc Nat. Albert, Miss. de Witte, fasc. 83: 22.

Paratendipis pictus Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* 25: 199.

Chironomus (Paratendipes) pictus Freeman, 1954, *Arch. Hydrobiol.* 48: 443.

Shining black; wings with heavy black transverse band and a large spot in anal cell; thorax with pruinose "bloom"; legs black, anterior basitarsi mostly white, other tarsi yellowish; hypopygium with appendage 1 broadened subapically, appendage 2 slightly bilobed at apex.

In wing markings and leg colour this species and the next two are very distinct from other African species and similar to the Samoan and Fijian species *C. melanocnemis* Edwards and *candidibasis* Edwards. I have been unable to distinguish *cordatus* and *collarti* satisfactorily except by using hypopygial characters, especially as *cordatus* seems variable in wing pattern, but *leucolabis* has a distinctive wing pattern and pale abdomen. It is possible that *cordatus* wing pattern is always more extensive than that of *collarti* but more specimens are needed to confirm the difference.

Male. Wing length 2–2.4 mm.

Head black, very small frontal tubercles present, antennae and plumes black, A.R. about 3. *Thorax* shining black or very dark brown, with pruinose "bloom" especially anteriorly and on pleura; dorso-central bristles uniserial and black, scutellum slightly paler in some specimens. *Legs* black or very dark brown, tibiae being particularly dark, trochanters and bases of femora yellowish, anterior basitarsus white on basal two-thirds or more, posterior 4 tarsi yellowish-white; L.R. 1.5. *Wings* (Pl. 1, fig. *g* and fig. *h* of female) with heavy black or dark brown markings with purplish reflections; the main marking is a broad transverse band the width of R_1 but variable in extent as shown; the second marking is a large spot in the anal cell; there is often though not always, a third spot anterior to the second in the basal cell and sometimes a longitudinal dark streak in this cell; all markings are subject to variation in size but the base of cell R_5 is always completely dark. Halteres black or dark brown. *Abdomen* black with either shining or pruinose bands at the incisures; segment 6 with 5–6 black spines ventrally. Hypopygium (Text-fig. 7, *c*) either black or with yellow styles; appendage 1 broadened sub-apically and with apex hooked, appendage 2 more or less cordiform or slightly bilobed at apex.

Female resembles male in colour although wing markings (Pl. 1, fig. *h*) are usually more extensive. Antennae with about 4–5 long hairs on each of segments 2–5, each being as long as segments 2–5 together, segments more or less fusiform, 6 as long as 4 and 5 together.

The type series of *cordatus* is probably lost (type locality, FRENCH CAMEROONS: Kribi), but I have seen the holotype male of *pictus* in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Kisantu).

DISTRIBUTION. SUDAN: 7 ♂, Khartoum, xi. 1951 (*D. J. Lewis*); 7 ♂, Liednum, nr. Wau, iii–iv. 1955 (*E. T. M. Reid*). UGANDA: 1 ♂, 1 ♀, Lake Nabugabo, xi. 1934 (*F. W. Edwards*). TANGANYIKA: 1 ♂, Kware, Moshi, i. 1952 (*E. Lindner*). BELGIAN CONGO: 1 ♂, Stanleyville (*Mouchet*); 1 ♀, Lac Eduard, Rutshuru, i. 1936 (*H. Damas*). S. RHODESIA: 1 ♀, Salisbury, i. 1900 (*G. A. K. Marshall*). The two type localities are in addition to these.

Chironomus (Dicrotendipes) collarti Goetghebuer

Chironomus (Dicrotendipes) collarti Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 466.

The male is very similar to *cordatus* in colour and general structure; the wing markings (Pl. 1, fig. *i*) in the few specimens known to me are less extensive and

absent from the basal cells, which may prove to be a specific character. Hypopygium (Text-fig. 7, *d*) white, appendage 1 of fairly even width, slightly swollen at apex, appendage 2 with definite fork at apex, the apical hairs are sharply divided into two groups, one to each branch. The female is not known.

I have seen the holotype male in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Ituri, Alokoko).

DISTRIBUTION. KENYA: 1 ♂, Aberdare Range, Chania Falls, 4,000 ft., x.1934 (F. W. Edwards). BELGIAN CONGO: 1 ♂, Katanga, Kafubu Mission, ix.1931 (A. Mackie); holotype, Ituri, Alokoko. NYASALAND: 1 ♂, Blantyre (J. B. Davey).

Chironomus (Dicrotendipes) leucolabis Kieffer

Dicrotendipes leucolabis Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 65.

Polypedilum aequatoris Goetghebuer, 1936, *Rev. Zool. Afr.* **28**: 482 (SYN. NOV.).

Structurally this species is very similar to *collarti*, the main point of separation being that appendage 1 of the male hypopygium is more swollen at the apex judging from Kieffer's figure. In colour, however, it is quite distinct from the previous two because the main body colour is brown rather than black, the thorax is slightly metallic with scutellum, postnotum and sternopleuron reddish, the legs are reddish-yellow with anterior tibia brown or pale centrally (basitarsus missing) and the abdomen yellowish, each segment with a narrow basal black band. The wing pattern is distinctive because the main wing band is distal to the apex of R_1 and covers the apex of R_{2+3} and extends beyond it, the basal half of cell R_5 is thus left clear; there is a quadrate spot in the anal cell and none in the basal cells.

The type of *leucolabis* is probably lost (type locality FRENCH CAMEROONS: Kribi) but I have seen Goetghebuer's specimen and can state that there are two spurs on the posterior tibia and that it definitely belongs to this genus and not to *Polypedilum*. Although it is a female, the wing pattern and colour of the body are sufficiently definite for it to be synonymized with *leucolabis*. Type locality of *aequatoris*, BELGIAN CONGO: Equateur, Flandria; no other specimens are known.

Chironomus (Dicrotendipes) binotatus Kieffer

Chironomus binotatus Kieffer, 1911, *Trans. Linn. Soc. Lond. (Zool.)* **14**: 354.

Chironomus seychelleanus Kieffer, 1911, *ibid.* **14**: 356 (in part).

Type specimens of both the above species are in the British Museum. The single specimen of *binotatus* is a male of a species very similar to, but slightly different from *chambiensis* Goetghebuer. *C. seychelleanus* is represented by a male of *C. (Chironomus) callichirus* Kieffer and a female conspecific with *binotatus*. As mentioned under *C. callichirus* I have fixed the specimen of that species as the lectotype and made the name a synonym by page priority.

C. binotatus is a small green species with reddish scutal stripes; the darker lateral stripes mentioned by Kieffer are due to irregular drying of the thoracic muscles. Thorax shining, anterior tibiae whitish and with black apices, male anal point long and curved, appendage 2 not as swollen as in *chambiensis*.

Male. Wing length 1.8–2.0 mm.

Head greenish-brown, antennae reddish-brown, A.R. about 2.0. *Thorax* shining, yellowish-green; stripes, postnotum and sternopleuron reddish-brown. *Legs* yellowish-brown, anterior femur dark at apex, anterior tibia whitish and with dark apex, L.R. nearly 2. *Wings* plain, halteres white. *Abdomen* plain green; hypopygium (Text-figs. 7, *e*, *l*) with anal point long and curved in side view, appendage 1 clubbed, appendage 2 long and narrow, not as swollen at apex as *chambiensis*.

Female resembles male in colour; antennal segments fusiform, last segment equal to 4 and 5 together.

Holotype male of *binotatus* and female cotype of *seychelleanus* in British Museum (type locality SEYCHELLES: Mahé).

DISTRIBUTION. Apart from the Seychelles specimens, I have seen PORTUGUESE EAST AFRICA: 1 ♂, Delagoa Bay, Lorenzo Marques, iv. 1920 (*W. C. C. Pakes*).

Chironomus (Dicrotendipes) chambiensis Goetghebuer

Chironomus (Limnochironomus) chambiensis Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 464.

In colour, size and general structure extremely similar to *binotatus*, it differs by A.R. being about 2.5 (possibly variable), front legs more uniformly brown and thorax slightly pruinose. Main difference lies in male hypopygium (Text-figs 7, *f*, *m*) in which anal point is shorter, stouter and less curved and appendage 2 more strongly swollen at apex.

I have seen the holotype male in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Kabasha, Chambi).

DISTRIBUTION. UGANDA: 1 ♂, Budongo Forest, ii. 1935 (*F. W. Edwards*). BELGIAN CONGO: 1 ♂, Parc National Albert, Cratère Mugunga (*de Wulf*); 10 ♂, Elisabethville, xii. 1938 (*H. J. Brédo*).

Chironomus (Dicrotendipes) kribicola Kieffer

Phytochironomus kribicola Kieffer, 1923, *Ann. Soc. ent. France*, 92 : 152.

Not unlike *binotatus* and *chambiensis* but darker and halteres dark; male hypopygium quite different, anal point broad and downturned, appendage 1 short and more transverse so that genitalia more like *ealae* sp. n. I have not seen the holotype, but the genitalia and other characters are so similar that I am in no doubt over its identity.

Male. Wing length 1.6 mm.

Head dark brown, A.R. about 3. *Thorax* yellow, shoulders whitish, stripes, postnotum and sternopleuron dark brown. *Legs* brown, L.R. about 2. *Wings* quite unmarked, halteres with dark knobs. *Abdomen* dark brown (? possibly scorched at light); hypopygium (Text-figs. 7, *g*, *n*) quite characteristic, anal point short broad and strongly bent, appendage 1 short and with transverse head, appendage 2 not unlike *chambiensis*; styles narrow and curved.

Female not known.

Type probably lost, type locality FRENCH CAMEROONS: Kribi.

DISTRIBUTION. BELGIAN CONGO: 2 ♂, Eala, i.-ii. 1935 (*J. Ghesquière*).

Chironomus (Dicrotendipes) bredoi Goetghebuer

Chironomus (Chironomus) bredoi Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 473.

Very similar to *chambiensis* and *kribiicola* but more pruinose, pleura with distinct bluish "bloom", male hypopygium peculiar and highly characteristic. In the original description, Goetghebuer confused appendages 1 and 2 so that his appendage 1 is really 2 and vice versa.

Male. Wing length 2.0 mm.

Head brown, pedicel pruinose, A.R. about 3.0. *Thorax* yellowish, shoulders paler; stripes, postnotum and most of pleura brown; thorax pruinose, pleura with distinct bluish "bloom" when viewed from the front. *Legs* yellowish, anterior knees broadly brown, L.R. 2; femora of front legs nearly twice as long as tibiae. *Wings* unmarked, halteres pale. *Abdomen* greenish-brown. Hypopygium (Text-fig. 7, *h*) quite characteristic; IXth tergite truncate, so that with anal point it appears trifid, appendage 1 with broad flat head and narrow finger-like lobe overlying it, appendage 2 very narrow and with about 3 short hairs at apex; styles narrow, slightly wider basally.

Female not known.

I have seen the holotype male in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Eala). Goetghebuer gives the length of the type as 7 mm. which is exaggerated even if the antennae are included; the wing length of the type is 2 mm. I have re-mounted the hypopygium of the type to confirm that Goetghebuer was in error in his interpretation of the appendages.

DISTRIBUTION. Apart from the holotype, I have seen one other specimen, from the same locality, ii. 1935 (*J. Ghesquière*) in Institut Royal des Sciences naturelles de Belgique.

Chironomus (Dicrotendipes) ealae sp. n.

Green with yellow or reddish-yellow thoracic markings. Readily distinguished from similarly coloured species by the structure of the male hypopygium and the bearded male tarsi.

Male. Wing length 2.5 mm.

Head brown, frontal tubercles absent, A.R. about 2.5. *Thorax* whitish-green and slightly pruinose; stripes, postnotum and sternopleuron yellow or reddish-yellow. *Legs* with femora and tibiae of all legs whitish green, anterior tarsi bearded, L.R. about 1.25. *Wings* quite unmarked, halteres whitish-green. *Abdomen* green, unmarked. Hypopygium (Text-figs. 7, *i*, *o*) with broad, downturned anal point; appendage 1 variable in shape, rather fleshy and with numerous microtrichia, sometimes more or less mushroom-shaped, broader at apex; appendage 2 slightly enlarged at apex and with hairs evenly arranged, styles pointed.

Female not known.

Holotype male and paratype 1 ♂, NATAL: Howick, iv. 1953 (*G. H. Satchell*) in British Museum; further paratypes, BELGIAN CONGO: 2 ♂, Eala, iv. v. 1936 (*J. Ghesquière*) in Institut Royal des Sciences naturelles de Belgique; 1 ♂, Kalondo (Kivu), viii. 1935 (*H. Damas*) in Institut des Parcs nationaux du Congo Belge.

Chironomus (Dicrotendipes) schoutedeni Goetghebuer

Chironomus (Limnochironomus) schoutedeni Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 465.

Green with reddish scutal stripes; anterior tibiae brownish. Most easily distinguished from other green species by the structure of the male hypopygium in which appendage 2 is large and racket-shaped and appendage 1 long and thin with a swollen apex.

Male. Wing length 2.2–2.5 mm.

Head brownish-green, very small frontal tubercles present, antennae brown, A.R. 3.5. *Thorax* moderately shining, green; stripes, postnotum and sternopleuron reddish-yellow. *Legs* yellowish-green; apex of femur, tibia and tarsus of anterior legs brown, L.R. 1.75. *Wings* plain, very slightly darker at cross-vein in some specimens, halteres green. *Abdomen* plain green with dark hairs. Hypopygium (Text-fig. 7, *j*) with conical IXth tergite and downturned anal point; appendage 1 long and narrow, apex sharply enlarged and with an inwardly turned point; appendage 2 curved below as usual but enlarged and racket-shaped; styles narrow and curved.

Female not known.

I have seen the holotype male in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Boma).

DISTRIBUTION. DAHOMEY: 4 ♂, nr. Porto Novo, xii.1954 (*J. Hamon*). NIGERIA: 1 ♂, Beri, ix.1910 (*J. J. Simpson*). SUDAN: 4 ♂, Yirol, xii.1954 (*E. T. M. Reid*). BELGIAN CONGO: 1 ♂, Eala, iv.1936; 1 ♂, Musosa, x.1939; 1 ♂, Maka Lualaba, i.1939 (all coll. *H. J. Brédo*).

Chironomus (Dicrotendipes) nigrolineatus sp. n.

Green with reddish-yellow thoracic markings, central stripe marked with black, anterior tibia and tarsus blackish, male hypopygium characteristic. In colour and appearance this species resembles the *chloronotus-regalis* group of species but in hypopygial structure it is closer to *schoutedeni* and other green species.

Male. Wing length 3 mm.

Head greenish, frontal tubercles probably absent, palpi brown, antennae reddish, A.R. 3.5. *Thorax* green with stripes, postnotum and most of pleura reddish-yellow; central stripe with a median black stripe, apex of postnotum also blackish. *Legs* greenish, apex of anterior femur, entire tibia and tarsus darkened; L.R. nearly 2 anterior femur five-sixths length of basitarsus. *Wings* quite unmarked, halteres green. *Abdomen* plain green. Hypopygium as in Text-fig. 7, *k*; appendage 1 broad and with inwardly directed point at apex, appendage 2 rather stout but not broadened as in *latilobus*, styles slightly narrower at apex.

Female resembles male in colour and leg structure; antennal segments 3–5 with long necks, 6 equal to 4 and 5 together.

Holotype male and paratypes 16 females, BELGIAN CONGO: Elisabethville, xii.1932–iii.1933 (*C. Seydel*) all in British Museum.

Chironomus (Dicrotendipes) chloronotus Kieffer

Chironomus chloronotus Kieffer, 1911, *Proc. Linn. Soc. Lond. (Zool.)* **14**: 355.

Chironomus niloticus Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 150 (SYN. NOV.).

Chironomus latilobus Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1): 384 (SYN. NOV.); Freeman, 1955, *South African Animal Life*. Uppsala, **2**: 371.

Chironomus henrardi Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 475 (SYN. NOV.).

This species shows considerable variation, not only in colour but also in the structure of the male hypopygium. The lectotype of *chloronotus* has a central dark band on the mesonotum, the abdomen plain and the hypopygium as in Text-fig. 8, *a*; in

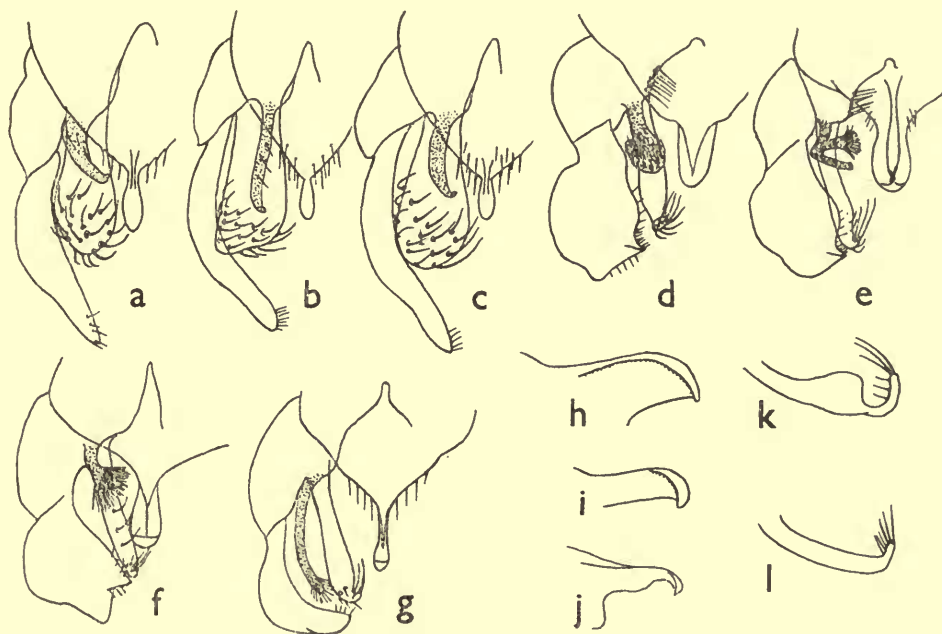


FIG. 8. Male hypopygia of *Chironomus* subg. *Dicrotendipes*; (a)–(g) in dorsal aspect, (h)–(j) anal point in lateral aspect, (k)–(l) appendage 2 in lateral aspect. (a) *C. chloronotus* lectotype; (b) *C. chloronotus* (*niloticus* form); (c) *C. chloronotus* (*latilobus* form); (d) *C. regalis*; (e) *C. multispinosus*; (f) *C. penicillatus*; (g) *C. crispus*; (h) *C. regalis*; (i) *C. multispinosus*; (j) *C. crispus*; (k) *C. multispinosus*; (l) *C. penicillatus*.

henrardi holotype the hypopygium and thorax are the same as this but the abdomen has black bands apically on the segments. *C. niloticus* was described from a specimen with the lateral thoracic bands blackish and the hypopygium as in Text-fig. 8, *b*; in the type of *latilobus* the hypopygium (Text-fig. 8, *c*) is not unlike *niloticus* but the thorax is totally pale; in both the abdomen is black-banded. Specimens taken at the same place on the same day and with identical hypopygia, falling into *latilobus*, may have banded abdomen and dark lateral thoracic stripes or the mesonotum and abdomen may be totally plain without black markings. In addition, there is some intergrading of hypopygial structure between all three groups.

In my opinion the most satisfactory solution is to treat all as belonging to a single variable species. The type form hypopygium is found in Seychelles and Belgian Congo, *niloticus* particularly in the Sudan, *latilobus* in South, Central, East and West Africa.

Male. Wing length 2.5–3.5 mm.

Head yellowish-brown, small frontal tubercles present, A.R. about 3.5. *Thorax* green or yellow with reddish stripes, postnotum and sternopleuron; either central or lateral stripes, or occasionally all three overlaid with broad black stripes in most specimens; occasional specimens have no black markings; postnotum often blackish. *Legs* yellowish or greenish, anterior legs with apex of femur, entire tibia and tarsus darkened or blackish, tibiae may be paler centrally; L.R. about 1.9, anterior femur about 1.75 times as long as tibia. *Wings* unmarked, halteres pale. *Abdomen* either plain green or yellowish-green with apical third of each segment darkened. Hypopygium as mentioned above, rather variable (Text-figs. 8, *a-c*). In the commonest form which was described as *latilobus*, the styles are narrow, appendage 1 moderate and appendage 2 racket-shaped; in *niloticus* appendage 1 is sometimes longer and appendage 2 slightly pointed, these two forms intergrade; *chloronotus* has wider styles and slightly smaller appendage 2, but it is not always easy to be certain whether a given specimen fits *chloronotus* better than *latilobus*.

Female resembles male in colour except that all the specimens that I have seen have the abdomen plain. Antenna with segments 3–5 with long necks, segment 6 one and a half times as long as 5.

I have seen a male of the type series of *chloronotus* in the British Museum which I now fix as lectotype (type locality SEYCHELLES: Mahé). I have also seen the holotype of *latilobus* which is in South African Museum (type locality S. RHODESIA: Salisbury) and of *henrardi* in Musée Royal du Congo Belge (type locality BELGIAN CONGO: Nyangwe). Although the type of *niloticus* is probably lost, Kieffer's figure of the male hypopygium makes the species readily identifiable (type locality SUDAN: Shambe).

DISTRIBUTION. Apart from type material I have seen: SUDAN: 2 ♂, 7 ♀, Tonga, xi.1953 (*E. T. M. Reid*); 3 ♂, Yirol, vii.1954 (*E. T. M. Reid*). NIGERIA: 3 ♂, Onitsha, x.1932 (*Anderson*); 1 ♂, Lokoja (*C. F. Watson*). GOLD COAST: 1 ♂, Accra, vii.1916 (*J. W. S. Macfie*); 1 ♂, Nangodi, x.1954 (*G. Crisp*). FRENCH WEST AFRICA: 10 ♂, 1 ♀, Bobo Dioulasso (Haute Volta), vii–ix.1956 (*J. Hamon*). DAHOMEY: 11 ♂, 3 ♀, Porto Novo (*J. Hamon*). UGANDA: 2 ♂, L. Mgogo, Ankole, ii.1912 (*R. E. McConnell*); 2 ♂, 3 ♀, L. Victoria (*W. W. Macdonald*). KENYA: 1 ♂, Mt. Elgon, Kapretwa (*F. W. Edwards*). BELGIAN CONGO: 6 ♂, 1 ♀, Eala (*J. Ghesquière*); 3 ♂, 8 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*); 1 ♂, 5 ♀, Elisabethville (*H. J. Brédo*); 1 ♂, Bambesa, vii.1943 (*J. Vrydagh*); 1 ♂, Flandria (*R. P. Hulstaert*); 1 ♂, Bassin Lukuga (*H. de Saeger*). NYASALAND: 1 ♀, Mt. Mlanje, xii.1912 (*S. A. Neave*). NATAL: 1 ♂, Richard's Bay, vii.1930 (*B. de Meillon*). CAPE PROVINCE: 1 ♀, Mossel Bay, ii.1922 (*R. E. Turner*); 1 ♂, Grahamstown, iii.1953 (*G. Satchell*). S. W. AFRICA: 2 ♂, 3 ♀, Ovamboland, ix.1934; 1 ♂, Kaokoveld, Ohopoho, vi.1951 (*P. Brinck*).

Chironomus (Dicrotendipes) regalis Goetghebuer

Chironomus (Carteria) regalis Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 465 (not *Carteria regalis* Freeman, 1955—see *penicillatus* sp. n. below).

Thorax with longitudinal black stripe from front to postnotum; L.R. 2·2, knees blackened, abdomen with black bands; male styles broad and with inwardly directed point, anal point deep in side view, appendage 1 large, simple, and turned up at apex. Most easily separated from the following three species by the male genital structure, although *multispinosus* can be distinguished by the arming of the posterior tibial combs.

Male. Wing length 2·5–3·0 mm.

Head yellowish-brown, frontal tubercles indistinguishable, A.R. about 3. *Thorax* yellowish, stripes slightly darker, line of acrostichal bristles covered by a black or dark brown longitudinal stripe extending from front of thorax right back over scutellum and postnotum. *Legs* yellow, all knees blackish, anterior ones more broadly so, anterior tibiae dark apically as well, L.R. about 2·2; posterior tibial combs normal, each with one spur. *Wings* plain, unmarked, halteres pale. *Abdomen* yellowish, each segment darkened on posterior half or third and occasionally more or less on the mid-line as well. Hypopygium (Text-figs. 8, *d*, *h*) with broad anal point which is deep in side view; styles broad and of irregular outline, with a blackened point on inner margin; appendage 1 usually broadened subapically and upturned, clothed with fine hairs; basal to appendage 1 is a brush of hair; appendage 2 similar to *multispinosus* (Text-fig. 8, *k*), swollen subapically and with extremity bent upwards and carrying a few hairs.

Female. Resembles male although central dark thoracic stripe is rather wider; abdomen similarly marked but these markings disappear in most dried specimens; antennae with segments 3–5 with slight necks, 6 equal to 4 and 5 together.

I have seen the holotype male in Musée Royal du Congo Belge (type locality BELGIAN CONGO, between Coquilhatville and Bumbo).

DISTRIBUTION. SIERRA LEONE: 1 ♀, Mabang, ix.1924 (*E. Hargreaves*). GOLD COAST: 6 ♂, Adidomi (*N. L. Braybrock*). BELGIAN CONGO: 1 ♀, Coquilhatville, ix.1910 (*A. Y. Massey*); 1 ♂, Stanleyville (*Mouchet*); 1 ♂, Lualaba R., Kabale, ix.1931 (*D. A. Cockerell*); 1 ♂, Boma, viii.1938 (*Nicolay*); 4 ♂, Eala (*J. Ghesquière*); 4 ♂, Mareba, viii.1911 (*Meuleman*).

Chironomus (Dicrotendipes) multispinosus sp. n.

In colour, general appearance and structure similar to *regalis*. Easily distinguished in both sexes by the peculiar inner comb of the posterior tibia which bears either 4 or 5 spurs evenly arranged around it, so that the tibia bears either 5 or 6 spurs altogether; this character is consistently shown by all eight specimens examined; combs of middle tibiae normal, each with one spur.

Male hypopygium equally characteristic (Text-figs. 8, *e*, *i*, *k*); anal point much narrower in side view than *regalis*, styles more rounded at apex, although this may not be constant; appendage 1 bifid, one branch with a brush of hair at apex, basal hair brush present; appendage 2 similar to *regalis*.

Holotype male, UGANDA: Lake Bunyoni, viii.1932 (*G. H. E. Hopkins*) in British Museum; paratypes, BELGIAN CONGO: 3 ♂, Eala (*J. Ghesquière*); 3 ♀, Flandria, ii.1929 (*R. P. Hulstaert*); 1 ♀, Lac Kibuga, S. Rutshuru, vii.1935 (*H. Damas*). FRENCH W. AFRICA: 3 ♂, Haute Volta, Banfora, xii.1956 (*J. Hamon*). Three paratypes returned to Musée Royal du Congo Belge, two to Institut Royal des Sciences naturelles de Belgique, two to O.R.S.T.O.M., remainder in British Museum.

Chironomus (Dicrotendipes) penicillatus sp. n.

Carteria regalis Freeman, 1955, *S. Afr. Animal Life*. Uppsala 2: 371 (not Goetghebuer, 1936).

This species is again very similar to *regalis*. Antennal ratio about 2.5; thoracic markings as in *regalis*, legs perhaps darker, L.R. no more than 1.75, spurs normal; abdomen darker, only basal third of segments 2-5 obscurely pale. Hypopygium distinctive (Text-figs. 8, *f*, *l*); anal point narrow in side view, as in *multispinosus* (Text-fig. 8, *i*); styles with sharper and more angular outlines; appendage 1 simple and with dense brush of hair at apex, basal brush absent; appendage 2 not swollen subapically.

Holotype male, CAPE PROVINCE: Betty's Bay, i.1956 (*K. M. F. Scott*) in British Museum; paratypes, 5 ♂, 1 ♀, Cape Peninsular, Hout Bay, Skoorsteenkop, ii.1951 (*P. Brinck*)—two males retained in British Museum, remainder returned to Lund University collection.

Chironomus (Dicrotendipes) crispus sp. n.

Extremely similar to *regalis* in colour and appearance, although the type specimens are slightly smaller (wing length 2.2 mm.), posterior tibial combs with the normal single spur each; separable from *regalis* and allied species by the structure of the male hypopygium (Text-figs. 8, *g*, *j*). Anal point much narrower, hooked in lateral aspect, styles of peculiar appearance, strongly bent, intermediate in form between *regalis* and a species such as *chloronotus*; appendage 1 long, narrow and hairy at the apex; appendage 2 similar to *penicillatus*, bent upwards at apex and without subapical enlargement.

Holotype male and paratypes 3 ♀, GOLD COAST: Red Volta, Nangodi, x.1954 (*G. Crisp*); further paratypes: NIGERIA: 1 ♂, 1 ♀, Funtua, x.1956 (*B. McMillan*). SUDAN: 1 ♂, Wau, x.1952 and 1 ♂, Adok, xi.1953 (*E. T. M. Reid*). All specimens are in the British Museum.

Chironomus MEIGEN SUBGENUS *Nilodorum* KIEFFER

Nilodorum Kieffer, 1921, *Ann. Soc. sci. Brux.* 40 (1): 272; Kieffer, 1921, *Ann. Soc. ent. France*, 90: 30 and 1922, *ibid.* 91: 45; Kieffer, 1925, *Bull. Soc. ent. Égypte*, 1924: 296; Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* 25: 196; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83: 19; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, 2: 372; Freeman, 1956, *Bull. I.F.A.N.* 18: 94.

Chironomus subg. *Nilodorum* Edwards, 1931, *Dipt. Patagonia S. Chile*, 2: 320; Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28: 464.

Chironomus subg. *Chironomus* Goetghebuer, 1936, *ibid.* 28: 470 (in part).

Tendipes subg. *Nilodorum* Goetghebuer, 1937, in Lindner, *Flieg. Pal. Region*, 3 (13c): 34.

Frontal tubercles absent, mouthparts and palpi greatly reduced, palp segments usually only twice as long as wide, occasionally 4–5 times as long as wide, antennae thick, plumes very bushy; prothorax reaching up to front of thorax but divided as in *Dicrotendipes*; thorax smooth and rounded in lateral aspect and heavily pollinose, usually without silvery pruinosity, bristles short, pale and inconspicuous; anterior tarsi of male usually heavily bearded; wings plain, cross-vein may be darkened; male hypopygium with both appendages 1 and 2 fully developed, appendage 2 very large, often racket shaped, styles hardly contracted apically.

The smooth rounded appearance of the thorax with its thick dull grey pollinose coating, combined with the short palpi and mouthparts, makes this subgenus easy to recognize. However, *fractilobus* Kieffer is not completely typical and tends to link the subgenus with *Dicrotendipes*, also *nigropunctatum* sp. n. shows some silvery pruinosity on the shoulders, so that it is not practical to treat it as a full genus.

Kieffer, Goetghebuer and myself have described from Africa 12 species and two varieties which are correctly to be placed in *Nilodorum*. Most of these are synonyms, and, in fact, I am only able to recognize five species, one of which is new.

KEY TO AFRICAN SPECIES OF *Chironomus* SUBG. *Nilodorum*

1. Thorax quite smooth and unmarked 2
 Mesonotum either wrinkled on anterior half or with four transverse black spots 4
2. Colour dark, abdomen with pale incisures; male tarsal beard reduced and only slightly developed; hypopygium with appendage 2 more elongate (Text-figs. 9, c, g) *fractilobus* Kieffer
 Colour paler, especially in male, abdomen of male usually pale or pale with dark markings; beard fully developed; hypopygium with appendage 2 wider 3
3. Appendage 2 of male hypopygium oval or nearly oval (Text-fig. 9, a) *brevibucca* Kieffer
 Appendage 2 angular and strongly emarginate at apex (Text-figs. 9, b, f) *brevipalpis* Kieffer
4. Mesonotum without dark spots but strongly wrinkled on anterior half *rugosum* nom. nov.
 Mesonotum not wrinkled but with a transverse row of four dark spots in the male (female not known) *nigropunctatum* sp. n.

Chironomus (Nilodorum) brevibucca Kieffer

Nilodorum brevibucca Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 45; Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25**: 196; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 19.

Nilodorum brevibucca var. *stilatum* Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 46; Kieffer, 1925, *Bull. Soc. R. ent. Égypte* **1924**: 296.

Nilodorum brevibucca var. *caffrarium* Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1): 38.

Nilodorum nigritarse Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25**: 197 (syn. nov.).

Nilodorum burgeoni Goetghebuer, 1935, *ibid.* **26**: 398 (syn. nov.).

Chironomus (Nilodorum) burgeoni Goetghebuer, 1936, *ibid.* **28**: 464.

Chironomus (Nilodorum) nigritarsis Goetghebuer, 1936, *ibid.* **28**: 464.

The smooth grey evenly rounded thorax, combined with the strongly bearded front tarsi and racket-shaped appendage 2 of the male, make this one of the most easily recognized African species of the family. It can only be distinguished from *brevipalpis* with certainty by the structure of the male hypopygium.

I have not seen the type of *brevibucca* which is probably lost, but the species can be easily recognized from the description; I can see no reason for maintaining *stilatum* as a distinct variety. I have seen the type specimens or series of the other three names all of which are normal specimens of *brevibucca*. They were all described from pinned specimens and would thus appear darker and with full pollinosity, whereas the type of *brevibucca* being in spirit would have the thoracic pollinosity masked and the whole insect would appear lighter and with pale stripes on the mesonotum.

Male. Wing length 3-4.5 mm.

Head yellowish-grey, frontal tubercles absent, pedicel brown, A.R. between 5 and 6, flagellum rather thick, plumes bushy and white or pale brown; palpi short, segments not more than twice as long as wide. *Thorax* smooth grey and rounded in outline, completely covered in grey pollinosity; stripes darker and just visible, postnotum and sternopleuron also darker; dorso-central bristles small, pale and inconspicuous, uniserial and only properly developed on posterior half of thorax; marginal bristles of scutellum pale and weak. *Legs* yellowish-green, apex of anterior femur, apices of all tibiae, anterior tarsal segments 2-5, darkened; in darker specimens anterior tibiae may be more generally darkened and the other femora may be darker apically; L.R. about 1.2, anterior tarsus with long and strong beard on segments 2-4. *Wings* with darkened cross-vein, halteres pale. *Abdomen* may be quite plain yellowish-green or each segment may carry a dark marking or the abdomen may be mostly dark, all intermediates occur. Hypopygium (Text-fig. 9, a) with broad IXth tergite and evenly enlarged appendage 2.

Female much darker than male; thorax dark grey, markings darker, dorso-central bristles partially biserial; knees more strongly darkened, beard absent; abdomen quite dark and with pruinosity or pollinosity; antennae with last segment longer than 4 and 5 together, 3-5 more or less fusiform.

Types of *brevibucca* and var. *stilatum* probably lost (type locality SUDAN: Shambe). Cotypes of var. *caffrarium* in South African Museum (locality S. RHODESIA: Salisbury). Holotypes of *nigritarse* (locality BELGIAN CONGO: Katana) and *burgeoni* (BELGIAN CONGO: Kamande) both in Musée Royal du Congo Belge.

DISTRIBUTION. Common and widely distributed; I have seen abundant material from the following localities. EGYPT: Fayoum. SUDAN: Khartoum, Adok, Yirol. GABOON: L. Asebb. SÉNÉGAL: Dakar. UGANDA: Jinja, Bukumi. BELGIAN CONGO: Parc National Albert. N. RHODESIA: L. Bangweulu. S. RHODESIA: Salisbury. NATAL: Pietermaritzburg. ORANGE FREE STATE: Harrismith, Zastron.

Chironomus (Nilodorum) brevipalpis Kieffer

Chironomus brevipalpis Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 69.

Nilodorum dewulfi Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25** : 196 (SYN. NOV.); Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83** : 20; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 372.

Chironomus (Nilodorum) dewulfi Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 464.

Chironomus (Chironomus) surdellus Goetghebuer, 1936, *ibid.* **28** : 478 (SYN. NOV.).

Chironomus (Chironomus) vitshumbiensis Goetghebuer, 1936, *ibid.* **28** : 479 (SYN. NOV.).

I have seen a cotype of *brevipalpis* and holotypes of the other three species and can confirm their synonymy. It is not clear why Goetghebuer described the last two species both in the same paper and in the wrong subgenus, especially as the male hypopygium is so characteristic and both bear identical data.

It is very similar to *brevibucca* and can only be separated with certainty by examining the male hypopygium (Text-fig. 9, *b, f*) in which appendage 2 is more or less square when seen laterally and is emarginate distally. It is on the average

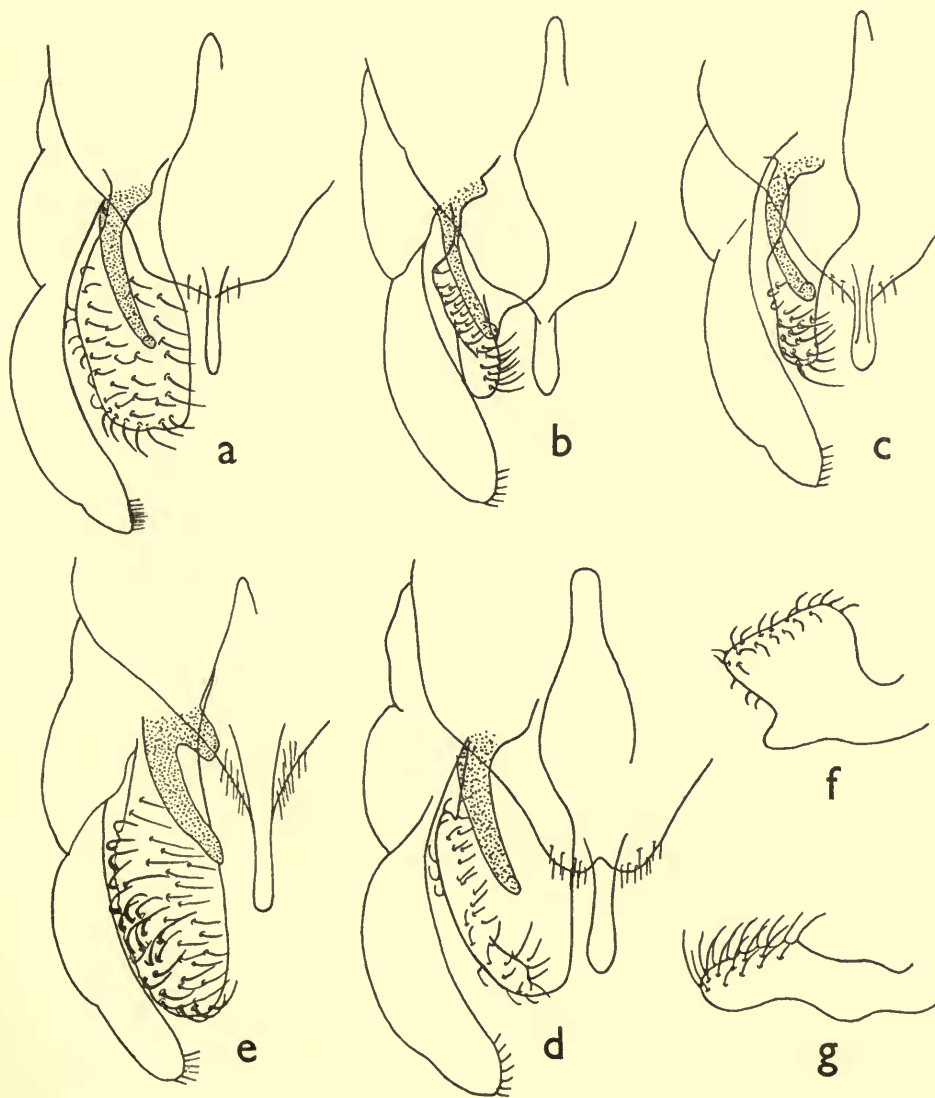


FIG. 9. Male hypopygia of *Chironomus* subg. *Nilodorum*; (a)–(e) in dorsal aspect, (f)–(g) appendage 2 in lateral aspect. (a) *C. brevibucca*; (b) *C. brevipalpis*; (c) *C. fractilobus*; (d) *C. rugosum*; (e) *C. nigropunctatum*; (f) *C. brevipalpis*; (g) *C. fractilobus*.

smaller (wing length 2.5–4 mm.) and paler in colour, the abdomen being unmarked in the male; male tarsal beard not as strong as in *brevibucca* but much stronger than in *fractilobus*. Females of *brevipalpis* and *brevibucca* very similar.

Cotypes of *brevipalpis* in Hungarian National Museum (type locality ETHIOPIA: L. Dembel). Holotypes of the other three in Musée Royal du Congo Belge; type localities BELGIAN CONGO: Katana (*dewulfi*); P.N.A., Vitshumbi (*surdellus* and *vitshumbiensis*).

DISTRIBUTION. I have seen series from SUDAN: Yirol; UGANDA: Jinja; BELGIAN CONGO: Parc National Albert; S. RHODESIA: Salisbury; and SOUTH WEST AFRICA: Kaokoveldt.

Chironomus (Nilodorum) fractilobus Kieffer

Phytochironomus fractilobus Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 151.

Chironomus (Chironomus) caligans Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 473 (SYN. NOV.).

Nilodorum elongatum Freeman, 1955, *Explor. Parc Nat. Upemba*, Miss. de Witte, fasc. **35** (6): 98; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fac. **83**: 20 (SYN. NOV.).

The identity of this species is now clear from Kieffer's figure of the male hypopygium; appendage 2 in Goetghebuer's figure is very poorly represented. It is a comparatively small dark species with hypopygial structure not unlike *brevipalpis*, but appendage 2 is more elongate and narrow; separable from both *brevipalpis* and *brevibucca* by its longer palpi and reduced tarsal beard.

Male. Wing length 2.75–3.0 mm.

Head brown, A.R. about 4; palpi rather longer than is usual in the subgenus, segment 2 about five times as long as broad, segments 3 and 4 subequal to it. *Thorax* dark grey, pollinosity not as striking as in other species, stripes hardly distinguishable, dorso-centrals uniserial. *Legs* pale brown, knees rather darker, anterior tibiae may be blackish on basal half and at apex, L.R. 1.4, anterior tarsi with short beard only, mostly on segment 3. *Wings* hyaline, cross-vein darkened, halteres pale. *Abdomen* brown with pale incisures; hypopygium (Text-figs. 9, c, g) rather similar to *brevipalpis* but appendage 2 quite different, especially when seen in lateral aspect.

Female generally similar to male but abdomen darker and unbanded, legs more distinctly marked with black at the knees and apices of tibiae.

Type series of *fractilobus* probably lost (type locality SUDAN: Shambe). I have seen holotype male of *caligans* in Musée Royal du Congo Belge (locality BELGIAN CONGO: Vitshumbi); the holotype male of *elongatum* is in Institut des Parcs Nationaux du Congo Belge (locality BELGIAN CONGO: L. Upemba, Mabwe).

DISTRIBUTION. Apart from material from type localities of *caligans* and *elongatum* I have seen SUDAN: series from Yirol, Rumbek, Juba and Tonga (E. T. M. Reid). NATAL: 1 ♂, Pietermaritzburg, xi. 1954 (B. Stuckenberg).

Chironomus (Nilodorum) rugosum nom. nov.

Nilodorum albitarse Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 46; Freeman, 1956, *Bull. I.F.A.N.*

18: 94 (not *Chironomus albitarsis* Lundstroem, 1913, *Acta Soc. Fauna Fenn.* **30**, No. 10: 14).
? *Nilodorum magna* Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 47.

Easily recognized by the large size, the wrinkling of the anterior part of the mesonotum and by the male hypopygium, in which the IXth tergite is bilobed at the apex.

I am in no doubt about the identity of *albitarse* although the type is probably lost but I am not so certain about *magnum*. Both species were collected in the same locality in the same month and I think it is probable that *magnum* is simply a paler form of *albitarse*, the main difference being that only the knees are broadly dark in the female instead of the whole femur and tibia. Exact identification must await further collecting. The name *albitarse* becomes a homonym with the downgrading of *Nilodorum* to a subgenus; owing to the doubtful position of *magnum* I have preferred to choose a new name.

Male. Wing length 4-4.5 mm.

Head grey, palpi short, each segment about twice as long as broad, frontal tubercles absent, antennae thick, plumes very bushy and pale, A.R. about 5. *Thorax* grey and thickly covered with pollinosity, anterior part of mesonotum with transverse wrinkles; stripes, postnotum and sternopleuron brown but markings scarcely visible through the pollinosity; dorso-central bristles uniserial. *Legs* yellow and without markings except at apices of tarsal segments; L.R. scarcely 1.1, anterior tarsi with strong and well formed beard on segments 2-4. *Wings* with cross-vein darkened, halteres pale. *Abdomen* brownish-green, without dark markings; hypopygium (Text-fig. 9, *d*) with IXth tergite bilobed at apex, appendage 2 large and curved upwards laterally, hairs reduced in number and short.

Female resembles male in wrinkling of thorax, but much darker in colour. Whole body a dark grey over a darker cuticle, femora and tibiae dark brown, tarsi pale with extreme apices of segments darkened, femora sometimes paler basally.

The type of females of both species appear to be lost (locality of both SUDAN: Shambe).

DISTRIBUTION. SUDAN: 1 ♀, Shambe and 1 ♀, Adok, xi.1953 (*E. T. M. Reid*); 1 ♀, Yirol, vi-vii.1954 (*E. T. M. Reid*); 1 ♂, 1 ♀, Liednum, nr. Wau, iii-iv.1955 (*E. T. M. Reid*). UGANDA: 5 ♀, L. Victoria, Bukoba, i.1955 (*P. S. Corbet*). NIGERIA: 15 ♂, Gadau, iv.1933 (*D. J. Lewis*); 1 ♂, Onitsha, (*V. B. Wigglesworth*). GAMBIA: 1 ♂ (*Hopkinson*). FRENCH SUDAN: 2 ♀, Macina (*Th. Monod*).

Chironomus (Nilodorum) nigropunctatum sp. n.

A very large species, male thorax grey with four dark spots across the middle, shoulders with some silvery pruinosity; abdomen with a vague central brown line, knees pale, IXth tergite of male conical, appendage 1 with an extra lobe at the base. Superficially it resembles *C. (Chironomus) tetraleucus*.

Male. Wing length 6 mm.

Head brownish-yellow, palpi perhaps slightly longer than in *brevibucca*, segments 2-4 about three times as long as wide, frontal tubercles absent; antennae thick, plumes bushy and pale, A.R. about 6. *Thorax* with yellowish background thickly overlaid with pollinosity, main part of stripes, postnotum and sternopleuron hardly darker; each central stripe with a comma-shaped dark spot at its posterior end,

each lateral stripe with a small oval blackish spot at its anterior end, together making a row of four dark spots across the centre of the mesonotum; lateral margins of lateral stripes with a dark streak as well; dorso-central bristles biserial and extending further forwards than usual; anterior part of line of bristles and oval spot on shoulders lacking grey pollinosity but with silvery shimmering pruinosity; scutellum with several rows of short pale hairs. *Legs* thick and hairy, pale yellow, anterior knees vaguely darker, anterior tarsi missing in the only known specimen, other tarsi with segments darker at apex. *Wings* with cross-vein slightly darkened, halteres pale. *Abdomen* yellowish with silvery pruinosity and with a vague central brown line. Hypopygium (Text-fig. 9, *e*) distinguished from other species by conical IXth tergite, long anal point, oval and very hairy appendage 2 and more or less branched appendage 1.

Female not known.

Holotype male, TRANSVAAL: Pretoria, iii.1914 (*J. Brincker*) in British Museum.

Chironomus MEIGEN SUBGENUS *Xenochironomus* KIEFFER

Xenochironomus Kieffer, 1921, *Bull. Soc. Hist. nat. Moselle*, **29** : 69 ; Townes, 1945, *Amer. Midl. Nat.* **34** : 91 (in part).

Chironomus subg. *Chironomus* Group B, Series 3, Edwards 1929, *Trans. ent. Soc. Lond.* **77** : 385.

Chironomus subg. *Xenochironomus* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 468 ; Freeman, 1955, *Explor. Parc nat. Albert*, Miss. de Witte, fasc. **83** : 16.

Frontal tubercles absent, palpi fully developed, prothorax reaching up to front of thorax, but divided by a suture as in *Dicrotendipes*, thorax not pruinose, body colour green, wings unmarked, male hypopygium with appendage 1 reduced to a small pubescent lobe, appendage 2 well formed, anal point broad, deep in lateral aspect.

This subgenus is intermediate between *Dicrotendipes* and *Cryptochironomus*, the important feature being the reduction of appendage 1 whilst appendage 2 is retained. The broad and deep anal point is also shown to a lesser extent by *C. (Dicrotendipes) satchelli*. It is probable that the North American species placed by Townes (1945) in *Xenochironomus* should mostly be placed in *Dicrotendipes*. There are two African species known.

KEY TO AFRICAN SPECIES OF *Chironomus* SUBG. *Xenochironomus*

- | | |
|--|----------------------------|
| Anal point of male very deep in lateral aspect, appendage 2 narrow and with 2-3 hairs at apex (Text-figs. 10, <i>b</i> , <i>d</i>) | <i>trisetosus</i> Kieffer |
| Anal point less deep in lateral aspect, appendage 2 racket-shaped, although sometimes appearing narrow because viewed edge-on, with about 12 hairs (Text-figs. 10, <i>a</i> , <i>c</i>) | <i>ugandae</i> Goetghebuer |

Chironomus (Xenochironomus) ugandae Goetghebuer

Chironomus (Xenochironomus) ugandae Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 468.

Chironomus (Xenochironomus) ? ugandae Freeman, 1955, *Explor. Parc nat. Albert*, Miss. de Witte, fasc. **83** : 16 ; Freeman, 1955, *Explor. Parc nat. Upemba*, Miss. de Witte, fasc. **35** (6) : 98.

Goetghebuer described this species as brown with black brown thoracic stripes and greenish abdomen, but his holotype is in very poor condition and this may

account for its dark colour, or it may have been scorched at light. My specimens, which have hypopygia identical to his, are green with reddish thoracic stripes. The thick anal point, reduced appendage 1 and racket-shaped appendage 2 make the male easy to recognize; it is doubtful whether the female can be separated from other similarly coloured species.

Male. Wing length 2.3–2.5 mm.

Head, mouthparts and palpi green or yellowish, frontal tubercles absent, pedicel reddish, A.R. 2.75. *Thorax* green or yellowish; stripes, apex of postnotum and sternopleuron reddish-yellow. *Legs* green, anterior tibiae dark at least at base and apex, apex of femur sometimes similarly coloured, all tarsi brown; L.R. about 1.3, beard absent. *Wings* with cross-vein hardly darkened, halteres pale. *Abdomen* green, unmarked. Hypopygium (Text-figs. 10, *a*, *c*) with broad anal point which is strongly bent downwards at apex, appendage 1 greatly reduced and with a few hairs,

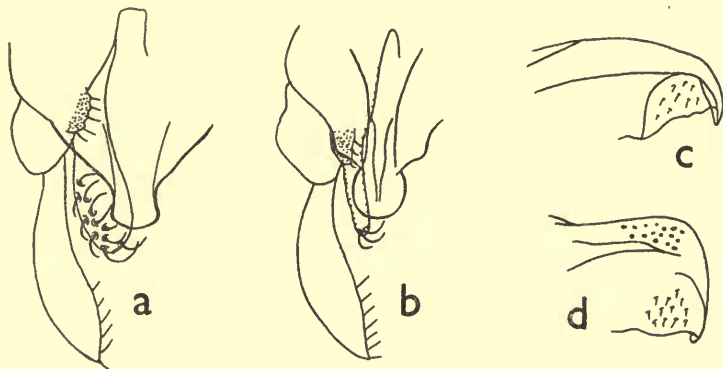


FIG. 10. Male hypopygia of *Chironomus* subg. *Xenochironomus*; (*a*)–(*b*) in dorsal aspect, (*c*)–(*d*) anal point in lateral aspect. (*a*) *C. ugandae*; (*b*) *C. trisetosus*; (*c*) *C. ugandae*; (*d*) *C. trisetosus*.

appendage 2 racket-shaped, in many specimens more or less tilted so that it is seen edge-on and appears much narrower.

Female not identified with certainty, but probably similar in colour and pattern to male.

I have seen the holotype male in Musée Royal du Congo Belge (type locality UGANDA: Namasagali).

DISTRIBUTION. SUDAN: 4 ♂, Adok, xi.1953 (*E. T. M. Reid*). UGANDA: holotype. BELGIAN CONGO: 29 ♂, Kivu, Goma (*J. Verbeke*); 3 ♂, Ituri, Lake Albert, ii.1953 (*J. Verbeke*); 6 ♂, Parc National Albert (*de Witte* and *Damas*); 1 ♂, Parc National de l'Upemba (*de Witte*).

Chironomus (Xenochironomus) trisetosus Kieffer

Cladopelma trisetosum Kieffer, 1922, *Ann. Soc. ent. France*, 92: 54.

I have only been able to separate this species from *ugandae* by the very characteristic structure of the male hypopygium (Text-figs. 10, *b*, *d*). Anal point exces-

sively deep and tall in side view, appendage 2 narrow and finger-like with only 2-3 hairs at the apex, styles and the greatly reduced appendage 1 similar to *ugandae*.

I have not seen the type which is probably lost (type locality SUDAN: south of Khartoum). Kieffer's figure of the male hypopygium is sufficient for the identification of the species.

DISTRIBUTION. SUDAN: 5 ♂, Melut, xi. 1953 (*E. T. M. Reid*). BELGIAN CONGO: 1 ♂, Kivu, Ile Wahu and 27 ♂, Albertville (*J. Verbeke*).

Chironomus MEIGEN SUBGENUS *Cryptochironomus* KIEFFER

Cryptochironomus Kieffer, 1918, *Ent. Mitt.* 7 : 46 ; Kieffer, 1923, *Ann. Soc. ent. France*, 92 : 153 ; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924 : 282 ; Townes, 1945, *Amer. Midl. Nat.* 34 : 96 ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83 : 16.

Nilomyia Kieffer, 1921, *Ann. Soc. sci. Brux.* 40 (1) : 270 ; Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 27 (SYN. NOV.).

Kribiocryptus Kieffer, 1921, *Ann. Soc. sci. Brux.* 40 (1) : 270 ; Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 28.

Cladopelma Kieffer, 1921, *Ann. Soc. sci. Brux.* 40 (1) : 274 ; Kieffer, 1921, *Bull. Soc. Hist. nat. Moselle*, 29 : 63 ; Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 31 ; Kieffer, 1922, *ibid.* 91 : 50 ; Harnisch, 1923, *Zool. Jahrb. Syst.* 47 : 304 ; Kieffer, 1925, *Bull. Soc. R. ent. Égypte* 1924 : 279.

Gillotia Kieffer, 1921 *Ann. Soc. sci. Brux.* 40 (1) : 272 ; Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 31 (SYN. NOV.).

Harnischia Kieffer, 1921, *Bull. Soc. Hist. nat. Moselle* 29 : 69 ; Townes, 1945, *Amer. Midl. Nat.* 34 : 147 (both subg. *Harnischia* and *Cladopelma*).

Chironomus Kieffer, 1923, *Ann. Soc. ent. France*, 92 : 149 (in part).

Psectrocladius (!) Kieffer, 1924, *Ann. Soc. sci. Brux.* 43 (1) : 260 (not Kieffer, 1906, *Mém. Soc. sci. Brux.* 30 : 356).

Chironomus subg. *Chironomus* Groups D and E, Edwards, 1929, *Trans. ent. Soc. Lond.* 77 : 387.

Chironomus subg. *Cryptochironomus* Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* 25 : 198 ; Goetghebuer, 1936, *ibid.* 28 : 469.

Chironomus subg. *Harnischia* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 470.

Tendipes subg. *Cryptochironomus* Goetghebuer, 1937, in Lindner, *Flieg. Pal. Reg.* 3 (13c) : 34.

Frontal tubercles present or absent, palpi fully developed ; prothorax reaching up to front of mesonotum, usually more or less divided by a suture as in *Dicrotendipes*, sometimes collar-like but more often thinner and closely applied to mesothorax, occasionally with a slight central indentation but without a strong V-shaped emargination. Colour variable, thorax sometimes pruinose or with grey dusting, wings often with cross-vein darkened. Last tarsal segment on all legs flattened dorso-ventrally ; combs of middle and posterior tibiae variable : in most species separate, well formed and each with a distinct spur ; in some species they are fused and in others indistinctly separated, occasionally only one spur is present and in *C. aculeatus* the combs are fused and both spurs are absent. Male hypopygium with appendage 2 greatly reduced or almost absent, appendage 1 variable, often well formed ; anal point variable.

My definition and use of *Cryptochironomus* includes all species of the genus *Chironomus* in which appendage 2 of the male hypopygium is greatly reduced or rudimentary. Additional characters such as the flattening of the fifth tarsal segment

and the appearance of the pronotum are usually sufficient to place the females in the subgenus. Goetghebuer (1937) employed the subgenus in a very similar way.

There have been a number of attempts at splitting this large and often unwieldy group into further genera or subgenera, but in my opinion these attempts are unsatisfactory and often impractical because the definitions are mainly based on male genital characters. Several of the larger species show a tendency for the thorax to approach the condition seen in *Chironomus* sensu stricto and the tarsal character is not sufficient for generic status. I therefore see no alternative but to regard the group as a single subgenus of *Chironomus*.

Nilomyia was described by Kieffer to include a species from Sudan lacking spurs on the tibial combs. In all other characters of genitalia, thorax, tarsi, etc., it agrees with *Cryptochironomus* and I am regarding it as an aberrant species of this subgenus.

Kribiocryptus included two species, which according to Kieffer had only one spur on the posterior tibial comb. The colour and genital structure of *K. viridiventris* show that it is an earlier description of *Cryptochironomus niligenus* Kieffer; Kieffer either had a damaged specimen or else did not notice the two short spurs. The other species, *K. flaviventris* (= *unicalcar* nom. nov.), was fixed by Townes (1945) as type of the genus and has only a single tibial spur. As in *Nilomyia* it agrees closely with *Cryptochironomus* and I am again regarding it as an aberrant species of this genus.

Cladopelma was first described by Kieffer without included species in a key to the genera of the tribe "Chironomariae". The first species to be mentioned were Palearctic ones in his paper in the same year in *Bull. Soc. Hist. nat. Moselle*. Harnisch (1923) chose *C. virescens* Meigen as type of the genus which invalidates Townes later (1945) fixation of *C. laminata*. Kieffer only described the female of the type species and it is not possible to be absolutely certain that it belongs to the subgenus *Cryptochironomus* as recognized here but it seems highly probable that it does. Most of the African species placed by Kieffer in *Cladopelma* fit well into *Cryptochironomus*. His original key separates *Cladopelma* because the pulvilli are branched instead of being reticulate, although in his key to the African genera (1921) he does not mention the reticulation but simply states "pulvilli not branched". I have made stained preparations of various species and can see no differences between the pulvilli of any of them. Edwards (1929) separated his group D (*Cladopelma*) from group E (*Cryptochironomus*) mainly because in the former, appendage 2 is broad and distinguishable in the dry specimen. In my opinion so much variety is shown in the size of appendage 2 that this distinction cannot be used. Townes (1945) treated *Cladopelma* as a subgenus of *Harnischia*.

Gillotia was erected for a species from the Sudan with easily recognizable male hypopygium but with antennae formed as in the female. I have two specimens with normal male antennae which shows that Kieffer's specimen was an intersex of a species of *Cryptochironomus*.

Psectrocladius was used by Kieffer for a female from Rhodesia. His description mentions the dorsal narrow portion of the eyes and examination of the type shows it to be a species of *Cryptochironomus*.

Kieffer erected *Harnischia* for a species with trilobed IXth tergite in the male.

Goetghebuer (1937) indicated that Kieffer himself had established that this was an earlier description of a species without trilobed tergite that had been described by Goetghebuer. Goetghebuer has used the name for a group of species of his subgenus *Cryptochironomus* in which both coxite appendages are short or absent. Townes (1945) raised it to generic status again, placing *Cladopelma* as a subgenus. I am following Goetghebuer and treating it as a synonym of *Cryptochironomus*.

Edwards and Goetghebuer recognized species groups in the Palaearctic species, basing their groupings on leg colour, presence of frontal tubercles and structure of male hypopygium. Most of these represented groups previously considered by Kieffer and Harnisch to be of generic status. I find that in the African species it is much more difficult to recognize well-defined species groups, although the male genitalia do offer some characters enabling what appear to be allied species to be placed next to each other; the species allied to *lindneri* and to *forcipatus* are examples. In general there is too much intergrading for satisfactory groupings to be offered.

As in the Palaearctic species there is similarity in external structure and appearance between many of the species and the only reliable and distinctive characters lie in the male genitalia. Except in the minority of distinctive species, females are almost impossible to identify in the absence of males. In addition, colour characters are unreliable and several of the green species may have the thoracic markings reddish-yellow, brown or black, different colour forms appearing in different localities, or there may be variation in the same locality.

Kieffer has described 33 African species and one variety in various genera that belong or seem to belong to *Cryptochironomus*. Of these I have been able to recognize all but 12, all of which were described from the female alone. I am giving an annotated list of these 12 species at the end of my treatment of the species of the subgenus. Goetghebuer has described three species, the types of which I have been able to study. I have myself described ten species some of which I now know to be varieties of species described by Kieffer. Altogether I am recognizing 29 species in the material at my disposal, eight being described as new.

KEY TO AFRICAN SPECIES OF *Chironomus* SUBG. *Cryptochironomus*

1. Thorax and abdomen black, at least mesonotal stripes shining 2
 If dark in colour then mesonotum grey with pruinosity or dusting 4
2. Wing length 2.5 mm., brilliantly shining, abdomen with velvety bands at apices of abdominal segments 2 and 3, four posterior tibiae black, tarsi yellow
 nigrocorporis nom. nov. 3
 Not brilliantly shining, abdomen lacking velvety bands, posterior tibiae mainly pale 3
3. Wing length 2.5 mm., combs with well-formed spurs *rhodesianus* Kieffer
 Wing length 1.5 mm., spurs reduced and hardly projecting beyond combs
 pullatus sp. n. 6
4. Yellowish species, abdomen and thorax both with black markings 5
 Usually green or brown, if yellow then black markings not present on both abdomen and thorax 6
5. Lateral thoracic stripes and sometimes central one as well, black; second abdominal segment with broad black band, succeeding segments usually with some trace of narrow bands *niligenus* Kieffer

- Mesonotum with four large black spots each side, the anterior two of each side joined and half surrounding a silvery spot on the shoulder; abdomen with black bands on segments 2-8 *coronatus* Kieffer
6. Mesonotum with a central cone terminating in two small tubercles, eyes separated by less than their terminal width *camelus* Kieffer
Mesonotum not like this, eyes wider apart 7
7. Posterior tibiae with only one spur or else spurs completely absent 8
Combs with normal two spurs 10
8. Combs lacking spurs, male hypopygium as in Text-fig. 11, *k* *aculeatus* Kieffer
Posterior tibiae with a single spur 9
9. Thorax dark brown and pruinose, hypopygium as in Text-fig. 12, *i* *brincki* nom. nov.
Thorax yellowish-brown, stripes dark brown, hypopygium as in Text-fig. 13, *b* *unicar* nom. nov.
10. Thorax covered with grey pruinosity or dusting, stripes usually but not always visible through the dusting 11
Thorax green, stripes easily visible, not covered with grey dusting 18
11. Male styles shorter and thicker, not more than three times as long as wide (Text-figs. 11, *c-f*) 12
Male styles more elongate 15
12. Appendage 1 rounded and well formed, greener species 13
Appendage 1 elongate or nearly absent 14
13. Style shorter (Text-fig. 11, *c*) anterior tarsus of male bearded *lindneri* Freeman
Style longer (Text-fig. 11, *d*) tarsus not bearded *neonilicola* nom. nov.
14. Style more elongate (Text-fig. 11, *e*) *diceras* Kieffer
Style oval (Text-fig. 11, *f*) *subovatus* Freeman
15. Style more or less straight 16
Style definitely bent or curved 17
16. IXth tergite produced at lateral margins (Text-fig. 11, *g*) *trifidus* nom. nov.
IXth tergite not so produced (Text-fig. 11, *h*) *cinereithorax* Goetghebuer
17. Style curved, appendage 1 long and curved (Text-fig. 11, *j*) *sinuatus* sp. n.
Style bent, appendage 1 rudimentary (Text-fig. 13, *e*) *inflexus* sp. n.
18. Male styles short and thick cf. *lindneri* and *nilicola*
Male styles longer 19
19. Styles more or less swollen in basal half (Text-figs. 12, *a-e*) 20
Styles not at all swollen in basal half 24
20. Styles strongly swollen or produced near the middle, anal point with setose swelling just before the middle (Text-fig. 12, *b*) *stilifer* Freeman
Styles not as swollen as this 21
21. Anal point shorter and thicker (Text-figs. 12, *c, e*) 22
Anal point longer and thinner (Text-figs. 12, *a, d*) 23
22. Style straighter, inner margins of coxites produced ventrally (Text-fig. 12, *e*) *acutus* Goetghebuer
Style curved, coxites not produced (Text-fig. 12, *c*) *deribae* sp. n.
23. Coxite appendages longer, style thicker (Text-fig. 12, *a*) *forcipatus* Freeman
Coxite appendages shorter, style thinner (Text-fig. 12, *d*) *dewulfianus* Goetghebuer
24. Style long, swollen at apex, appendage 1 long and bent (Text-fig. 11, *l*) *lewisi* sp. n.
Hypopygium not like this 25
25. Anal point broad 26
Anal point narrow 27
26. Appendage 1 curved, styles merging imperceptibly into coxites (Text-fig. 12, *h*) *reidi* sp. n.
Appendage 1 straight, styles and coxites with a definite point of separation (Text-fig. 12, *g*) *melutensis* sp. n.

27. At least one definite coxite appendage present 28
 Coxite appendages not developed 29
28. Styles evenly curved, separated from coxites (Text-fig. 13, a) *hirsti* sp. n.
 Styles bent near the apex, not separated from coxites (Text-fig. 13, d) *graminicolor* Kieffer
29. Styles straight (Text-fig. 13, g) *nudiforceps* Kieffer
 Styles bent (Text-fig. 13, f) *lacteiforceps* Kieffer

***Chironomus (Cryptochironomus) niligenus* Kieffer**

Kribiocryptus viridiventr Kieffer, 1921, *Ann. Soc. ent. France*, 90: 44 (not Kieffer, 1911, *Rec. Ind. Mus.* 6: 162).

Chironomus niligenus Kieffer, 1923, *ibid.* 92: 149.

Cryptochironomus fuscitarsis Kieffer, 1923, *ibid.* 92: 154 (SYN. NOV.).

Cryptochironomus longiventr Kieffer, 1923, *ibid.* 92: 157 (SYN. NOV.).

? *Cryptochironomus aculeatus* Kieffer, 1923, *ibid.* 92: 157 (not Kieffer, 1921, *ibid.* 90: 38).

A large yellow species with reddish central and dark lateral thoracic stripes, central stripe sometimes dark especially in the female; anterior legs largely dark; abdomen yellow with variable dark bands, but segment 2 almost invariably carrying a broad band; thoracic pleura with strong silvery shimmer; anterior tarsi of male slightly bearded; male hypopygium with greatly reduced coxite lobes, styles pointed.

The size and colour, especially the broad dark band on segment 2 of the abdomen make this species easily recognized in both sexes. The tibial spurs are short and Kieffer seems to have overlooked one when he placed this species in *Kribiocryptus*; the colour and structure show that it is the same species as he later described in *Cryptochironomus* as *fuscitarsis*, but the use of subgenera causes *viridiventr* to be a homonym. *C. niligenus*, *fuscitarsis*, *aculeatus* and *longiventr* were all captured at the same place and on the same date but *aculeatus* differs, according to the description, by the prolongation of the last tergite in the female as a brown sharp point; in other respects it agrees with the others and until a specimen showing this character can be found, I am assuming Kieffer's specimen to be aberrant.

Male. Wing length 2.5–3.0 mm., body length up to 6 mm.

Head yellow or brown, palpi well developed, frontal tubercles present but very small, antennae yellowish-brown, A.R. about 3.5. *Thorax* yellow and shining, central stripe, sternopleuron and apex of scutellum reddish or occasionally brown, lateral stripes blackish-brown, pleura with conspicuous silvery shimmer; pronotum collar-like but without central V-shaped emargination. *Legs* yellow; anterior tibiae usually but not invariably dark brown, anterior tarsi blackish, base of basitarsus often pale, segments 2–5 of posterior four tarsi darkened; L.R. about 1.3, anterior tarsus with slight beard; combs fused, tibial spurs two in number and rather short. *Wings* with cross-vein slightly darkened, halteres with blackish knobs. *Abdomen* yellow; segment 2 largely occupied by a broad black band which is emarginate posteriorly, segment 4 with a narrow band basally; other segments with indications of basal darkening but seldom with definite bands. Hypopygium (Text-fig. 11, a) darkened, styles pointed, coxite appendages very reduced, anal point long.

Female very similar to male in pattern, often rather darker and central thoracic stripe more frequently black. Last antennal segment nearly three times as long as fifth, segments 3–5 with short stout necks.

Type material of all five species probably lost; type locality of *viridiventris* FRENCH CAMEROONS: Kribi, of all the other four SUDAN: Shambe.

DISTRIBUTION. SUDAN: 6 ♂, 2 ♀, Yirol, iii.1954 and vi–vii.1954 (*E. T. M. Reid*); 1 ♂, 1 ♀, nr. Wau, iii–iv.1955 (*E. T. M. Reid*). UGANDA: Many specimens taken at light, Bukakata (*P. S. Corbet*). KENYA: 1 ♀, in aeroplane, Kisumu, xi.1936 (*C. B. Symes*). NIGERIA: 1 ♂, Onitsha, x.1932 (*Anderson*). To these must be added the type locality of *viridiventris*.

Chironomus (Cryptochironomus nigrocorporis nom. nov.

Cryptochironomus leucopus Kieffer, 1923, *Ann. Soc. ent. France*, 92 : 156 (not *Chironomus leucopus* Meigen, 1830, *Syst. Besch.* 6 : 249).

A large shining black species, halteres yellow, anterior femur and posterior four tarsi yellow, apical quarters of second and third abdominal segments velvety black; easily distinguished in both sexes from other species by its colour and size. The downgrading of *Cryptochironomus* causes *leucopus* to become a homonym.

Male. Wing length 2.5 mm., body length 5 mm.

Head black, palpi brown, antennae brown, A.R. about 3.5, small frontal tubercles present. *Thorax* shining black all over, stripes indistinguishable, pleura with some pruinosity; prothorax collar-like and with a shallow central emargination. *Legs* largely black; trochanters, anterior femur, anterior basitarsus and segments 1–3 of posterior four tarsi yellow or yellow with obscure darkening at the tips; anterior tarsus slightly bearded, L.R. about 1.3, combs fused, two short spurs present. *Wings* with cross-vein and basal veins brownish, halteres yellow. *Abdomen* shining black, apical quarters of segments 2 and 3 velvety black. Hypopygium (Text-fig. 11, b) black, styles short, a single lobular coxite appendage present, anal point wider than in *viridiventris*.

Female similar to male in colour and pattern except that the velvety areas on the abdomen may be more extensive; antennal segments 3–5 fusiform, 6 as long as 4 and 5 together.

Type series probably lost, locality SUDAN: Shambe.

DISTRIBUTION. SUDAN: 17 ♂, 4 ♀, Melut, xi.1953 (*E. T. M. Reid*). UGANDA: 2 ♀, L. Albert, iii.1954 (*P. S. Corbet*). BELGIAN CONGO: 2 ♂, Kasenyi (L. Albert) ii.1953 (*J. Verbeke*); 1 ♂, Sabe, xii.1953 (*J. Verbeke*); 6 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*); 1 ♀, Elisabethville, ii.1939 (*H. J. Brédo*). FRENCH WEST AFRICA: 1 ♀, Haute Volta, Bobo Dioulasso, ix.1956 (*J. Hamon*).

Chironomus (Cryptochironomus) lindneri Freeman

Cladopelma (?) *pseudolabis* Kieffer, 1922, *Ann. Soc. ent. France*, 91 : 53 (not Kieffer, 1915, *Zool. Jahrb.* 39 : 111).

Chironomus (Cryptochironomus) lindneri Freeman, 1954, *Archiv. Hydrobiol.* 48 : 443.

Cryptochironomus lindneri Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83 : 16; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, 2 : 374.

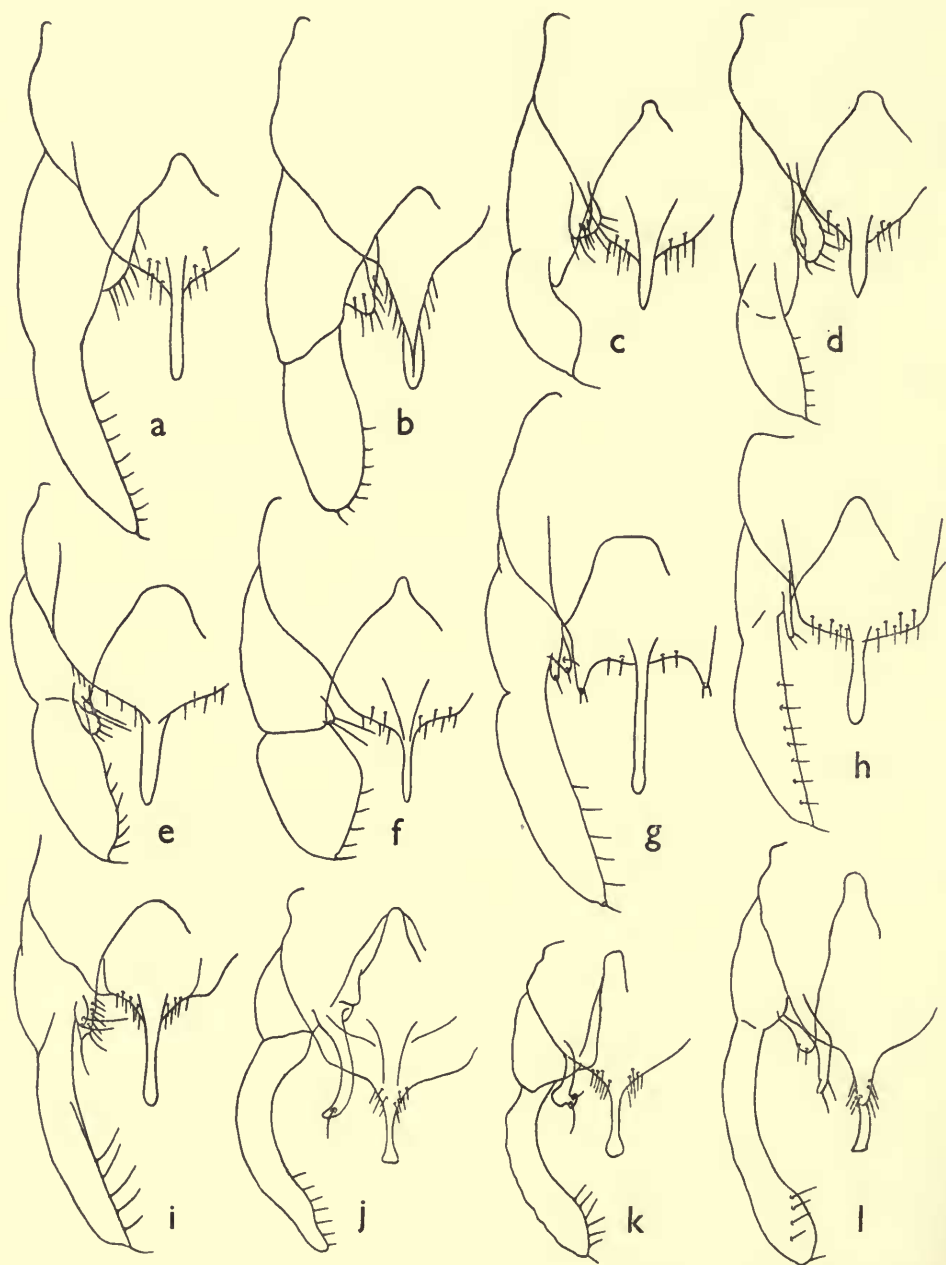


FIG. 11. Male hypopygia of *Chironomus* subg. *Cryptochironomus*. (a) *C. niligenus*; (b) *C. nigrocorporis*; (c) *C. lindneri*; (d) *C. neonilicola*; (e) *C. diceras*; (f) *C. subovatus*; (g) *C. trifidus*; (h) *C. cinereithorax*; (i) *C. camelus*; (j) *C. sinuatus*; (k) *C. aculeatus*; (l) *C. lewisi*.

Fairly large greenish species, thorax with grey pruinosity, stripes reddish, anterior legs usually darkened and tarsus usually slightly bearded in the male. Hypopygium with short styles, appendage 1 rounded.

The name *pseudolabis* was used by Kieffer for a species of *Chironomus* from Farøe Is., also now placed in the subgenus *Cryptochironomus*, and it was therefore necessary for a new name to be found for the later described African species. It is not difficult to separate, except from the next species, because there are few green species with the thorax grey dusted or pruinose; it is to be distinguished from *nilicola* by the shape of the male styles and by the slightly larger size.

Male. Wing length 2.5–3.0 mm., body length 4–6 mm.

Head greenish or brownish, palpi often rather short, frontal tubercles distinct, A.R. 4 or more. *Thorax* with green background; stripes, apex of postnotum and sternopleuron reddish or brown; whole thorax covered by light grey pruinosity through which the markings are clearly seen; prothorax collar-like and with a shallow central emargination. *Legs* green, anterior tibia, apex of femur and tarsus blackish in dark specimens but only brown in lighter ones; posterior four tarsi darkened at the tips; L.R. about 1.5, anterior tarsus usually with sparse beard, combs of posterior tibiae separate and each with a well-formed spur. *Wings* either plain or with very slightly darkened cross-vein, halteres green. *Abdomen* green; hypopygium (Text-fig. 11, c) with characteristic short styles, both appendages present, rounded and pubescent, IXth tergite broad.

Female very similar to male in colour and pattern; antennae with segments 3 and 4 with short necks, 5 with a longer neck, 6 equal to 4 and 5 together.

Holotype male probably lost, locality SUDAN: Shambe.

DISTRIBUTION. The following records are additional to my previously published records from BELGIAN CONGO (Parc Nat. Albert), CAPE PROVINCE, ORANGE FREE STATE. SUDAN: 2 ♀, Yirol, vi–vii.1954 (*E. T. M. Reid*). UGANDA: Series taken at light, L. Victoria (*W. W. Macdonald* and *P. S. Corbet*); 2 ♂, Mugango, iii.1952 (*E. Lindner*). BELGIAN CONGO: 12 ♂, 2 ♀, Elisabethville, xi.38–iii.39 (*H. J. Brédo*). N. RHODESIA: 1 ♂, L. Bangweulu, vi.1956 (*G. Fryer*). TRANSVAAL: 1 ♂, Assegai R., Piet Retief, ix.1954 (*A. D. Harrison*). CAPE PROVINCE: 1 ♂, Ceres, iii.1925 (*R. E. Turner*); 1 ♂, Wellington, xi.1955 (*K. M. F. Scott*).

Chironomus (*Cryptochironomus*) *neonilicola* nom. nov.

Cryptochironomus nilicola Kieffer, 1923, *Ann. Soc. ent. France*, 92: 161 (not *Calochironomus nilicola* Kieffer, 1922, *ibid.* 91: 70).

Colour and general structure similar to *lindneri*; separated by smaller size (wing length 2 mm.) and by the more elongate male styles (Text-fig. 11, d); in addition, the male tarsus appears not to be bearded. It is possibly only a small variety of *lindneri*. The use of *Cryptochironomus* as a subgenus and *Calochironomus* as a synonym of *Dicrotendipes* causes *nilicola* to be a homonym.

Type series probably lost, locality SUDAN: Shambe.

DISTRIBUTION. SUDAN: 12 ♂, 8 ♀, Khartoum, iv.1951 (*D. J. Lewis*); 8 ♂, Shambe, xi.1953 and 1 ♂, nr. Wau, ii–iv.1955 (*E. T. M. Reid*).

Chironomus (Cryptochironomus) diceras Kieffer

Cladopelma fimbriatum Kieffer,* 1922, *Ann. Soc. ent. France*, **91**: 55 (not Kieffer, 1910, *Mem. Ind. Mus.* **2**: 238).

Cryptochironomus diceras Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 163; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 18.

Thorax grey pruinose with dark brown stripes, abdomen dark brown or blackish; hypopygial structure resembles that of previous two species in general appearance but upper coxite appendage is narrow and curved, lower with two long bristles. Kieffer's two species were caught on the same day at the same place, have similar genital structure and are almost certainly synonymous but the use of subgenera causes the earlier to be a homonym.

Male. Wing length 1.75–2.0 mm.

Head dark grey pruinose, palpi brown, frontal tubercles well developed; antennae brown, A.R. about 2.5. *Thorax* grey pruinose; stripes, postnotum and sternopleuron dark brown, visible through the pruinosity; prothorax not collar-like, adpressed to front of the thorax. *Legs* yellowish-brown, anterior knees and apices of tibiae brown, L.R. nearly 2, anterior tarsus not bearded, combs separate, spurs well formed, one to each comb. *Wings* unmarked, halteres yellow. *Abdomen* dark brown or blackish. Hypopygium (Text-fig. 11, *e*) with stout anal point; both coxite appendages present, 1 curved and parallel-sided, 2 smaller and with two long bristles, styles more elongate than in *lindneri*.

Female resembles male in colour, segments 3–5 of antennae with distinct necks and long bristles, segment 6 one and a half times as long as 5.

Type specimens of both species probably lost, locality of both SUDAN: Shambe.

DISTRIBUTION. SUDAN: 11 ♂, 3 ♀, Khartoum, iv. 1952 (*D. J. Lewis*); 1 ♂, nr. Wau, iii–iv. 1955 (*E. T. M. Reid*). NIGERIA: 1 ♂, 6 ♀, Onitsha, x. 1932 (*D. Anderson*). FRENCH WEST AFRICA: 1 ♂, Haute Volta, Bobo Dioulasso, ix. 1956 (*J. Hamon*). BELGIAN CONGO: 22 ♂, 3 ♀, Parc Nat. Albert (*H. Damas*). TRANSVAAL: 2 ♂, Marble Hall, v. 1955 (*A. D. Harrison*).

Chironomus (Cryptochironomus) subovatus Freeman

Chironomus (Cryptochironomus) subovatus Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23**: 20.

Cryptochironomus subovatus Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2**: 375.

In general appearance, colour and size similar to *diceras*; legs of type series rather pale, in other specimens coloured as in *diceras*; frontal tubercles either absent or very small. Readily separated from *diceras* and other dark species by the male hypopygium (Text-fig. 11, *f*) in which styles are short and broad, anal point narrow and only one coxite appendage present carrying two bristles.

Holotype male in British Museum, type locality CAPE PROVINCE: Berg R., Piquetberg.

DISTRIBUTION. CAPE PROVINCE: Holotype and other specimens, Piquetberg; paratypes, Ceres; 1 ♂, Upington (*Brinck*). SUDAN: 4 ♂, Khartoum, ii. 1923 (*S. Hirst*) and 1 ♂, iv. 1952 (*D. J. Lewis*); 5 ♂, 2 ♀, Liednum nr. Wau, iii. iv. 1955 (*E. T. M. Reid*). FRENCH WEST AFRICA: 1 ♂, Bobo Dioulasso, ix. 1956 (*J. Hamon*).

***Chironomus (Cryptochironomus) trifidus* nom. nov.**

Gillotia fuscipes Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 62 (not *Chironomus fuscipes* Kieffer, 1909, *Munster Jahr. Prov. Wiss.* **37** : 31).

A dark species very similar to *diceras* and *subovatus*, A.R. rather higher and L.R. lower, readily distinguished in the male by the shape of the IXth tergite. With the synonymizing of *Gillotia fuscipes* becomes a homonym.

The male hypopygium is so distinctive that there can be no doubt over its identity. Kieffer's description was based on a specimen with female type antennae and male hypopygium and was almost certainly an intersex caused by a parasitic worm (see Pt. I, p. 18). My specimens are normal and carry plumed antennae.

Male. Wing length 2.0–2.75 mm.

Head brown, frontal tubercles indistinguishable, antennae brown, A.R. about 4. *Thorax* grey with pruinosity; stripes, postnotum and sternopleuron dark brown or blackish; prothorax applied to front of thorax. *Legs* brown, front ones dark brown, L.R. 1.3, combs separate, each with a well-formed spur. *Wings* unmarked, halteres more or less pale. *Abdomen* blackish; hypopygium (Text-fig. 11, g) with anal point long and slender and lateral margins produced so that IXth tergite appears trilobed; two small coxite appendages present, style long and with straight inner margin.

Female not known to me. According to Kieffer segments 3–5 of antennae are fusiform and segment 6 is twice as long as 5.

Holotype is probably lost, locality SUDAN: Shambe.

DISTRIBUTION. SUDAN: 1 ♂, Khartoum, x.1951 (*D. J. Lewis*); 1 ♂, Melut, xi.1953 (*E. T. M. Reid*).

***Chironomus (Cryptochironomus) cinereithorax* Goetghebuer**

Chironomus (Cryptochironomus) cinereithorax Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25** : 199. *Cryptochironomus brunnescens* Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 373 (SYN. NOV.).

Resembles *trifidus* but perhaps darker, A.R. and L.R. nearer to those of *diceras*, frontal tubercles distinguishable, anal point thicker than in *fuscipes*, IXth tergite not trilobed, only one coxite appendage present.

Examination of Goetghebuer's type shows that his figure of the male hypopygium is inaccurate and that the little lobes he has drawn at the base of the anal point and at the lateral angles of the IXth tergite do not exist. My species must therefore fall as a synonym.

Male. Wing length 2–2.5 mm.

Head, mouthparts and pedicel blackish-brown, small frontal tubercles distinguishable, A.R. about 2.5. *Thorax* with dark grey pruinosity, through which darker stripes can just be distinguished (the greenish colour mentioned in the description of *brunnescens* was due to the surface pruinosity being damaged by body fluids; spirit specimens do appear paler). *Legs* brown, anterior tibiae and apices of femora darker, L.R. 1.8, tarsus not bearded, combs separate and each with a spur. *Wings* unmarked, halteres pale. *Abdomen* dark brown; hypopygium (Text-fig. 11, h)

with broad IXth tergite which is not produced at the lateral angles, anal point thicker and shorter than in *trifidus*, style straight, coxite with a single appendage.

Female not known.

Holotype male of *cinereithorax* in Musée Royal du Congo Belge; of *brunnescens* in British Museum.

DISTRIBUTION. CAPE PROVINCE: Holotype of *brunnescens*, Kimberley; paratype, Mt. Fletcher. BELGIAN CONGO: Holotype of *cinereithorax*, Kivu; 2 ♂, Maka Lualaba, i. 1939 (*H. J. Brédo*).

Chironomus (Cryptochironomus) camelus Kieffer

Cryptochironomus niloticus Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 162 (not *Chironomus niloticus* Kieffer, 1923, *ibid.* **92**: 150).

Cryptochironomus camelus Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924**: 286; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 18.

A very distinctive species easily distinguished in both sexes by the cone-shaped protuberance in the middle of the mesonotum ending in two small tubercles. Another unusual feature is the size and closeness of the eyes and the banding of the anterior femur especially in the female. Although Kieffer seems not to have noticed the peculiar thorax when he described *niloticus*, it is obviously an earlier description of *camelus* because of the closeness of the eyes and the banded femur but the name cannot be used because it is now a homonym.

Male. Wing length 2–2.5 mm.

Head brown, mouthparts whitish, eyes with the dorsal narrow portions longer than usual and only separated by less than their terminal width; frontal tubercles absent; antennal plumes white with the hairs brown at their bases, A.R. about 2.5. *Thorax* with grey pruinosity overlying a greenish background and reddish-brown stripes, postnotum and sternopleuron; mesonotum produced centrally into a cone which ends in a small tubercle on each side of the acrostichal bristles which are better developed than usual at this point; prothorax closely applied to thorax. *Legs* whitish; anterior knees, apices of tibiae and apices of all tarsal segments dark; L.R. 2, anterior tarsus with slight beard, combs separate and each with a spur. *Wings* plain, halteres whitish. *Abdomen* dark green, segments 2–5 each with a large black marking occupying their apical three-quarters; segments 1 and 6 may have traces of similar markings. Hypopygium (Text-fig. 11, i) with well-developed anal point, styles fairly straight, more blunt-ended in side view, two small coxite appendages present.

Female differs from male in the much darker abdomen and the better developed dark markings on the anterior legs; anterior femur broadly darkened apically and basally, anterior tibia may have apex and basal half brown; antennae with segments 3–5 fusiform, segment 6 one and a half times as long as 5.

Types of both species probably lost; type locality of *niloticus* SUDAN: Shambe, of *camelus* EGYPT: Maadi.

DISTRIBUTION. SUDAN: Series of both sexes taken at light, Khartoum (*D. J. Lewis*), also at Adok, Melut and Shambe (*E. T. M. Reid*). BELGIAN CONGO: 4 ♂, 2 ♀, Ishango, Parc Nat. Albert (*Damas*).

Chironomus (Cryptochironomus) sinuatus sp. n.

In appearance not unlike *fimbriatus* and other dark species but all knees broadly darkened and the elongate and curved male styles and coxite appendage make it readily distinguishable.

Male. Wing length 2 mm.

Head and mouthparts brown, small frontal tubercles present, antennae brown, A.R. about 2.5. *Thorax* greenish, covered with grey pruinosity or dusting; stripes, postnotum and sternopleuron dark brown, prothorax more or less collar-like. *Legs* yellowish-brown, all knees broadly darkened including basal half of anterior tibia, all femora darker in basal half, tibiae dark at apices, front tarsi missing, other tarsi darker towards apices; combs fused, each with a spur. *Wings* plain, halteres pale. *Abdomen* very dark brown. Hypopygium (Text-fig. 11, *j*) with elongate curved styles, only one coxite appendage well formed, elongate and curving outwards, anal point broader at apex.

Female not known.

Holotype male SUDAN: Khartoum, x. 1951 (*D. J. Lewis*); paratypes, 2 ♂, SUDAN: Liednum, nr. Wau, iii-iv. 1955 (*E. T. M. Reid*); all specimens in British Museum.

Chironomus (Cryptochironomus) aculeatus Kieffer

Nilomyia aculeatus Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 38.

A grey species with darker thoracic markings, easily distinguished from all other African species of the subgenus known to me by the absence of spurs on the tibial combs. When Kieffer described this species he placed it in a separate genus because of the absence of tibial spurs, but all the other characters are so similar to those of *Cryptochironomus* that I have no hesitation in considering it simply to be an aberrant species of that subgenus, allied to *sinuatus*.

Male. Wing length 1.5-2.0 mm.

Head brown, small frontal tubercles present; scape blackish, plumes grey, A.R. about 2. *Thorax* covered with grey dusting, through which the darker stripes can be distinguished. *Legs* brown, last tarsal segment of all legs flattened, pulvilli well developed, L.R. about 1.3, tarsal beard absent, combs of four posterior tibiae fused and spurs completely absent. *Wings* whitish, halteres white, squama fringed. *Abdomen* olive-green or brownish; hypopygium (Text-fig. 11, *k*) with curved styles, anal point broadened at apex and down-curved; appendage 1 curved, swollen at apex and with an inner apical lobe bearing a long and a short seta, appendage 2 just distinguishable.

Female resembles male in colour; antennae with segments 3-5 oval, 6 equal to 4 and 5 together or slightly longer.

Type female probably lost, locality SUDAN: South of Khartoum.

DISTRIBUTION. EGYPT: 10 ♂, 2 ♀, Assuan, i. 1923 (*S. Hirst*); 1 ♂, Moascar, iii. 1942 (*J. W. S. Macfie*). SUDAN: 32 ♂, 18 ♀, Nile above Alaki, i. 1923 (*S. Hirst*); 20 ♂, 14 ♀, Meroe (*S. Hirst*); 10 ♂, Wadi Halfa (*S. Hirst*); 13 ♂, 8 ♀, Wadi Halfa (*D. J. Lewis*).

Chironomus (Cryptochironomus) lewisi sp. n.

Green with reddish-yellow thoracic markings; shows some resemblance to *sinuatus* in structure of male hypopygium but easily separated by clubbed style.

Male. Wing length 1.75 mm.

Head greenish, frontal tubercles absent, scape reddish-brown, flagellum broken. *Thorax* green; stripes, postnotum and sternopleuron reddish-yellow. *Legs* green, anterior tarsi broken, combs of middle and posterior tibiae fused, each with a spur. *Wings* plain, squama fringed, halteres green. *Abdomen* green, hypopygium (Text-fig. 11, *l*) with slightly clubbed and rather long styles, appendage 1 well formed and bent, appendage 2 reduced to a lobe; anal point curved downwards and carried at the end of a cone-shaped projection of the IXth tergite.

Female not known.

Holotype male SUDAN: Khartoum, x.1951 (*D. J. Lewis*) in British Museum.

Chironomus (Cryptochironomus) forcipatus Freeman

Cryptochironomus aegyptius Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924 : 288 [not *Tendipes* (= *Chironomus*) *aegyptius* Kieffer, 1913, *Rec. Ind. Mus.* 9 : 139].

Chironomus (Cryptochironomus) aegyptius Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 469.

Chironomus (Cryptochironomus) forcipatus Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* 23 : 20 ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. 83 : 17.

A small green species with either reddish or black thoracic markings. My species was described from specimens with dark markings, but I now see no reason for keeping them separate from the paler forms described by Kieffer. It is most easily separated from other species by the shape of the male styles; it most closely resembles *stilifer* and *deribae* but the shape of anal point and styles are sufficient to distinguish them.

It is possible that the female was earlier described by Kieffer as *Psectrocladius* [*sic*] *rhodesiae* and *Cryptochironomus ocularis* but for the present I prefer not to regard these as the same species (see notes at end of genus), but to use *forcipatus* in place of *aegyptius* which is now a homonym.

Male. Wing length 1.5–2.0 mm.

Head greenish, frontal tubercles absent, pedicel reddish or black, A.R. about 2. *Thorax* green; stripes, postnotum and sternopleuron either reddish or brown or black. *Legs* mostly green; front legs black or brown, femora paler in basal half especially beneath, posterior four tarsi darkened at the apices; L.R. 1.5, tarsal beard absent, combs fused, two rather long spurs present on each of four posterior tibiae. *Wings* plain, squama fringed, halteres green or yellow. *Abdomen* green, in very dark specimens appearing almost blackish. Hypopygium (Text-fig. 12, *a*) with styles slightly swollen basally, not separated from coxite; a single elongate coxite appendage present; anal point long, IXth tergite hairy around base of point as usual but with a pair of small lobes beneath, each carrying a few hairs; these lobes may be drawn back as figured or they may project more as shown in the figure of *stilifer*.

Female resembles male in colour and pattern; eyes rather wide apart; antennal segments 3-5 oval, 6 as long as 3-5 together.

Type series of *aegyptius* probably lost, locality EGYPT: Maadi. Holotype male of *forcipatus* in British Museum, locality CAPE PROVINCE: Berg R., Piquetberg.

DISTRIBUTION. EGYPT: 1 ♂, Suez Canal, x.1934 (*F. W. Edwards*). UGANDA: Long series at light, Jinja (*W. W. Macdonald*). BELGIAN CONGO: 3 ♂, Parc Nat. Albert (*de Witte* and *Verbeke*). NATAL: 1 ♂, Sundays R., ix.1953 and 2 ♀, Mooi R., Keate's Drift (*A. D. Harrison*). CAPE PROVINCE: holotype and other specimens of *forcipatus*, Berg R. (*K. M. F. Scott*).

Chironomus (Cryptochironomus) stilifer Freeman

Chironomus (Cryptochironomus) stilifer Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) 23: 176.

This is obviously closely related to *aegyptius* and may only be a variety of it; the two were taken in a mixed series at Jinja by *W. W. Macdonald*. The main differences lie in the male genitalia but the leg ratio is possibly nearer 2 and none of the specimens that I have seen have black markings. The male styles (Text-fig. 12, *b*) have the basal swollen part exaggerated and the coxite appendage is longer than in *aegyptius*. The IXth tergite is more truncated and the apical hairs are carried on a swelling nearly half-way along the anal point, the two lateral lobes are much more obvious than they are in *aegyptius*.

Holotype male in British Museum.

DISTRIBUTION. CAPE PROVINCE: Holotype and other specimens, Berg R. (*K. M. F. Scott*). UGANDA: Long series at light, Jinja (*W. W. Macdonald*). SUDAN: Long series at light, Khartoum, iv.1951 and ii.1952 (*D. J. Lewis*); 3 ♂, Yirol, iii and xii.1954 (*E. T. M. Reid*).

Chironomus (Cryptochironomus) deribae sp. n.

Similar to *aegyptius* but rather larger, best distinguished by the male hypopygium with its short anal point and coxite appendage.

Male. Wing length 2.5 mm.

Head and mouthparts green, palpi normal, frontal tubercles absent, pedicel black, A.R. about 2.5. *Thorax* green; stripes, postnotum and sternopleuron black. *Legs* greenish, anterior legs with indication of darkening as in *aegyptius* but type series rather immature and possibly not fully darkened; L.R. 1.3, tarsus not bearded, combs fused, with two spurs on each tibia. *Wings* with cross-vein darkened, halteres pale. *Abdomen* dark green, styles whitish; hypopygium (Text-fig. 12, *c*) resembling that of *aegyptius* but style shape more exaggerated, anal point shorter and hairy, lateral lobes absent, coxite appendage shorter.

Female similar to male in colour, antennae broken.

Holotype male and paratypes 2 ♂, 1 ♀, SUDAN: Deriba, 7,500 ft., i.1954 (*D. J. Lewis*) all in British Museum.

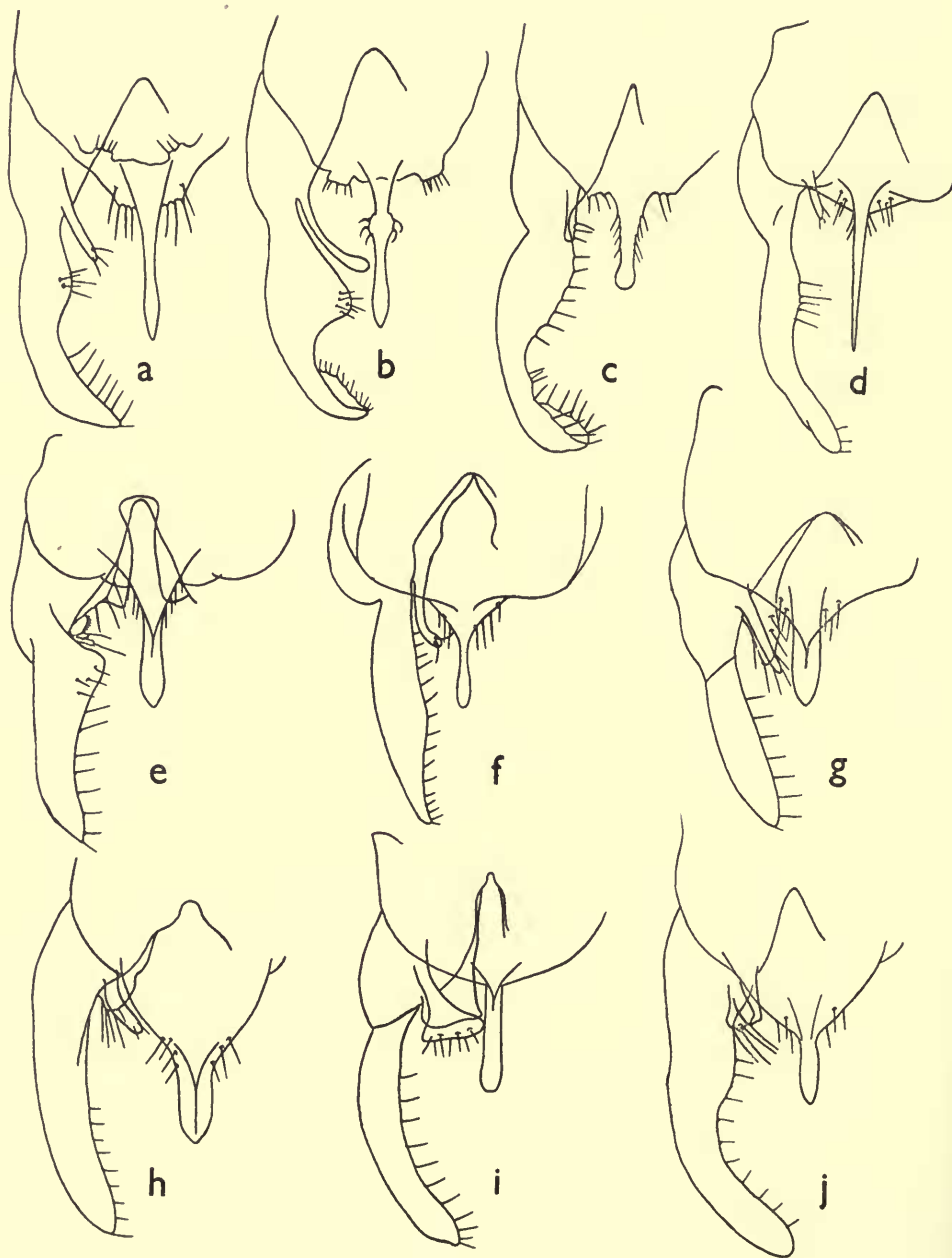


FIG. 12. Male hypopygia of *Chironomus* subg. *Cryptochironomus*. (a) *C. forcipatus*; (b) *C. stilifer*; (c) *C. deribae*; (d) *C. dewulfianus*; (e) *C. acutus*; (f) *C. coronatus*; (g) *C. melutensis*; (h) *C. reidi*; (i) *C. brincki*; (j) *C. rhodesianus*.

***Chironomus (Cryptochironomus) dewulfianus* Goetghebuer**

Chironomus (Cryptochironomus) dewulfianus Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25** : 198.

Cryptochironomus dewulfianus Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83** : 17.

A green species with brown or black thoracic markings, very similar to *aegyptius* from which it is most easily separated by the male hypopygium, the styles being longer and the anal point narrower.

Male. Wing length 1.5–2.0 mm.

Head green, mouthparts brown, frontal tubercles absent, pedicel brown, A.R. 2. *Thorax* green with some pruinosity; stripes, postnotum and sternopleuron brown or blackish. *Legs* greenish, anterior ones more brown, especially at the knees, apex of tibiae and on tarsi, but not definitely darkened; L.R. 1.75, tarsal beard absent, combs just separated, each with a spur. *Wings* unmarked, halteres pale. *Abdomen* green; hypopygium (Text-fig. 12, d) with narrow, bent styles which are slightly swollen basally; a single short coxite appendage present; IXth tergite broad at apex and not conical, anal point long and tapered.

Female not known.

I have seen the holotype male in Musée Royal du Congo Belge.

DISTRIBUTION. N. NIGERIA: 1 ♂, Kankiya, Katsina Prov., ix.1956 (*B. McMillan*). SUDAN: 1 ♂, Rumbek, vi–vii.1954 (*E. T. M. Reid*). UGANDA: 1 ♂, Namasagali, iv.1929 (*G. du Soleil*). BELGIAN CONGO: Holotype, Katana, Kivu; 1 ♂, Ishango (*Damas*); 5 ♂, Lakes Kivu, Edward and Albert (*J. Verbeke*). S. RHODESIA: 1 ♂, Salisbury, v.1956 (*E. T. M. Reid*).

***Chironomus (Cryptochironomus) acutus* Goetghebuer**

Chironomus (Harnischia) acutus Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 470.

Cryptochironomus acutus Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83** : 17.

Green with reddish-yellow or brown thoracic markings. Distinguished from similarly coloured species such as *aegyptius* by the structure of the male hypopygium, especially the shape of the styles and the very short coxite appendages.

Male. Wing length 2–2.5 mm.

Head and mouthparts green, very small frontal tubercles present, pedicel reddish, A.R. 2. *Thorax* green; stripes, postnotum and sternopleuron in pale specimens reddish-yellow, in darker specimens brown. *Legs* greenish, front ones slightly brown, L.R. 1.8, tarsal beard absent, combs separate, each with a spur. *Wings* plain, halteres green, squama fringed. *Abdomen* green; hypopygium (Text-fig. 12, e) with pointed styles which are swollen near the base; two small coxite appendages present, inner margin of coxite produced ventrally; anal point well developed, XIth tergite transverse.

Female similar to male in colour; antennal segments 3–5 oval, 6 twice as long as 5.

I have seen the holotype male in Musée Royal du Congo Belge, locality BELGIAN CONGO: Vitshumbi.

DISTRIBUTION. Besides already recorded material from BELGIAN CONGO: Parc

National Albert, I have seen the following: CAPE PROVINCE: 3 ♂, 8 ♀, Berg River, Wellington and Little Princess Vlei, iii-iv. 1953 (*K. M. F. Scott*). TRANSVAAL: 1 ♂, 2 ♀, Marble Hall, v. 1955 (*A. D. Harrison*). BELGIAN CONGO: 1 ♂, Musosa, x. 1939 (*H. J. Brédo*). NIGERIA: 1 ♂, Kankiya, x. 1956 (*B. McMillan*).

Chironomus (Cryptochironomus) coronatus Kieffer

Cladopelma coronatus Kieffer, 1922, *Ann. Soc. ent. France*, 91 : 52.

General colour yellowish, thorax with a thick U-shaped black mark each side anteriorly, the centre of each mark pruinose, and with additional black marks on the lateral margins and at the wing bases; abdominal segments black banded. Male hypopygium with pointed styles and a single long coxite appendage. The pattern makes the species conspicuous in both sexes.

Male. Wing length 2-2.75 mm.

Head yellow, palpi fairly long and brownish, frontal tubercles absent, pedicel yellow, plume hairs darker apically, A.R. 2.5. *Thorax* yellow, stripes slightly darker, lateral mesonotal margins and pleura with silvery pruinosity. Mesonotum with four large black spots each side, the anterior two of each side joined to form a thick U, the centre being a round silvery spot on the shoulder; the other two spots are one in the middle of the lateral margin and one above the wing base; postnotum blackish, sternopleuron reddish-yellow. *Legs* yellow with all knees, apices of all tibiae and of all tarsal segments broadly black; L.R. 1.6, tarsal beard absent, combs separate, spurs short. *Wings* with veins often seamed with grey, halteres pale. *Abdomen* yellow, segments 2-8 with a central transverse dark band which is expanded centrally as an oval spot on segments 2-4. Hypopygium (Text-fig. 12, f) with styles swollen near the middle and then tapered; coxites broad, a single narrow appendage present, IXth tergite broad, anal point well developed.

Female similar to male in colour and pattern; antennae with segments 3-5 spindle-shaped, 6 equal to 4 and 5 together.

Holotype male probably lost, locality FRENCH CAMEROONS: Kribi.

DISTRIBUTION. SUDAN: 1 ♂, 1 ♀, Amadi, vi-vii. 1954 (*E. T. M. Reid*). UGANDA: 8 ♀, Jinja, ix-x. 1954 (*P. S. Corbet*). BELGIAN CONGO: 1 ♀, Elisabethville, iv. 1939 (*H. J. Brédo*). NATAL: 1 ♂, Mooi R., Rosetta, ix. 1953 (*A. D. Harrison*).

Chironomus (Cryptochironomus) melutensis sp. n.

A small green species with reddish thoracic markings, very similar to other green species such as *reidi* in appearance but with different male hypopygium, appendage 2 being much larger and IXth tergite not conical.

Male. Wing length 1.5-1.8 mm.

Head greenish, frontal tubercles absent, pedicel reddish-yellow, flagellum broken. *Thorax* pale green with some pruinosity; stripes, postnotum and sternopleuron reddish-yellow. *Legs* green, tarsi browner towards the apices, front tarsi missing, combs fused, two spurs present. *Wings* plain, halteres green. *Abdomen* green.

Hypopygium (Text-fig. 12, *g*) with straight styles and broad anal point, both coxite appendages present, the upper one narrower than the lower.

Female not known.

Holotype male SUDAN: Melut, xi.1953 (*E. T. M. Reid*) in British Museum.

***Chironomus (Cryptochironomus) reidi* sp. n.**

Green with reddish-yellow or brownish stripes, L.R. 1.75, combs separate; best distinguished from similar species such as *melutensis* by the male hypopygium in which the styles are slightly curved and grade imperceptibly into the coxites, anal point broad, IXth tergite conical.

Male. Wing length 1.75–2.0 mm.

Head green or yellowish, scape reddish or brown, A.R. 2.5, frontal tubercles absent. *Thorax* green or yellowish; stripes, postnotum and sternopleuron reddish-yellow or partially brown. *Legs* green or yellowish, anterior tarsi slightly brownish, L.R. 1.75, tarsal beard absent; combs separate but touching, each with a well-developed spur. *Wings* plain, halteres green. *Abdomen* green; hypopygium (Text-fig. 12, *h*) with a broad anal point set on conical IXth tergite; styles slightly curved and merging imperceptibly into coxites; appendage 1 curved, 2 reduced but distinguishable as a hairy lobe.

Female not known.

Holotype male SUDAN: Liednum nr. Wau, iii–iv.1955 (*E. T. M. Reid*) in British Museum. Paratypes, BELGIAN CONGO: 3 ♂, Elisabethville, iii–iv.1939 (*H. J. Brédo*) in Institut Royal des Sciences Naturelles de Belgique.

***Chironomus (Cryptochironomus) brincki* nom. nov.**

Cryptochironomus biclavatus Freeman, 1955, *S. Afr. Animal Life*. Uppsala, 2: 373 (not *Chironomus biclavatus* Kieffer, 1923, *Ann. Soc. sci. Brux.* 42 (1): 384).

Dark brown, thorax pruinose, hypopygium with curved styles and two broad coxite appendages. Easily recognized by the presence of only one spur on the posterior tibiae. The original description was from a spirit specimen, now that a second pinned one is available, the colour is seen really to be a good deal darker. With the use of *Cryptochironomus* as a subgenus, the name *biclavatus* falls as a homonym.

Male. Wing length 2 mm.

Head, palpi and antennae dark brown, A.R. 1.5. *Thorax* dark brown and pruinose; stripes, postnotum and sternopleuron blackish. *Legs* dark brown, L.R. 1.8, tarsi not bearded, pulvilli rather small for the genus, posterior four tibiae with a single spur only, combs fused. *Wings* plain, halteres pale. *Abdomen* dark brown; hypopygium (Text-fig. 12, *i*) with curved styles and well-formed anal point; both coxite appendages present, the upper one strongly clubbed, the lower one less so.

Female not known.

Holotype male in Lund University collection, locality CAPE PROVINCE: Rhodes.

DISTRIBUTION. Apart from the holotype I have seen NATAL: 1 ♂, Tugela R., Royal Natal National Park, 4,500 ft., ix.1953 (*A. D. Harrison*).

Chironomus (Cryptochironomus) rhodesianus Kieffer

Cryptochironomus rhodesianus Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1) : 387.

Chironomus (Cryptochironomus) ater Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 176 (SYN. NOV.).

Cryptochironomus rudebecki Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 373 (SYN. NOV.).

Totally black except for four posterior tibiae and tarsi which are mainly yellowish, hairs pale. Distinguished from *nigrocorporis* by the black anterior tarsi and pale posterior tibiae and by the more elongate styles.

Examination of Kieffer's type has shown that *ater* must fall as a synonym. I described *rudebecki* from a spirit specimen and I am now convinced that it is the same as *rhodesianus*; the slight differences in the male hypopygium are caused through compression of the mount by the coverslip.

Male. Wing length 2.5 mm.

Head, mouthparts and scape black, flagellum brown, plumes black, A.R. rather more than 3, frontal tubercles absent. *Thorax* completely black, with some pruinosity but shining on the stripes. *Legs* black except for middle and posterior tibiae and tarsi which are yellowish and darkened at the ends of the segments, in one specimen the tarsi are mainly black; L.R. 1.25, tarsal beard present, combs fused, two spurs present. *Wings* unmarked, halteres black. *Abdomen* black with white hairs; hypopygium (Text-fig. 12, *j*) with curved styles which are not separated from the coxites; IXth tergite conical, anal point well formed, a single broad, hairy coxite appendage present, appearing double from above.

Female not known.

Holotype male of *rhodesianus* in South African Museum, of *ater* in British Museum, and of *rudebecki* in Lund University Museum.

DISTRIBUTION. CAPE PROVINCE: Type series of *ater*, Berg R., Piquetberg, Sout River Dam and Tulbagh Barrage; 1 ♂, Graaf Reinet, x.1931 (*A. Mackie*). BECHUANALAND: holotype male of *rudebecki*, Lobatsi. S. RHODESIA: Holotype male of *rhodesianus*, Salisbury.

Chironomus (Cryptochironomus) hirsti sp. n.

Green with reddish-yellow thoracic markings; distinguished from other similarly marked species by the male hypopygium, especially the evenly curved and rather stout styles.

Male. Wing length 1.5–1.8 mm.

Head yellowish or green, antennae yellowish, A.R. about 2, frontal tubercles probably absent. *Thorax* green; stripes, postnotum and sternopleuron reddish-yellow, stripes more or less fused. *Legs* uniformly yellowish, L.R. 2, tarsal beard absent, combs separate, each with a spur. *Abdomen* green, hypopygium (Text-fig. 13, *a*) with stout curved styles, thin anal point and broad appendage 1, appendage 2 just distinguishable.

Female not known.

Holotype male SUDAN: Khartoum, x.1951 (*D. J. Lewis*) and paratypes SUDAN: 1 ♂, Halfa (*S. Hirst*); 1 ♂, Makwar, ii.1923 (*S. Hirst*) all in British Museum.

Further paratypes BELGIAN CONGO: 7 ♂, Maka Lualaba, i.1939 (*H. J. Brédo*); 1 ♂, Eala, ix.1936 (*J. Ghesquière*) all in Institut Royal des Sciences Naturelle de Belgique.

***Chironomus (Cryptochironomus) unicalcar* nom. nov.**

Kribiocryptus flaviventris Kieffer, 1921, *Ann. Soc. ent. France*, 90: 45 (not *Chironomus flaviventris* Johannsen, 1907, *Lawr. Kans. Univ. Sci. Bull.* 4: 111).

A small species with dark brown thoracic stripes and yellowish-brown abdomen, readily separated by the single tibial spur on the posterior legs and by the "waisted" form of the male styles; the other species with a single spur (*brincki*) is larger and has a completely different male hypopygium. Although Kieffer gave the length of his specimen as 3 mm., there can be little doubt that the material described here is of the same species because of the similarity of the male hypopygium to his figure and the presence of only one tibial spur. Altering the genus to *Chironomus* makes *flaviventris* a homonym.

Male. Wing length 1.5 mm.

Head, antennae and mouthparts brown, A.R. about 1.5, frontal tubercles absent. *Thorax* yellowish-brown, stripes, postnotum and sternopleuron dark brown. *Legs* yellowish-brown, last tarsal segment flattened on all legs, pulvilli well formed, L.R. 1.5, tarsal beard absent, combs of posterior four tibiae fused and carrying a single spur only. *Wings* plain, halteres yellow, squama bare. *Abdomen* yellowish brown or brown; hypopygium (Text-fig. 13, *b*) with very characteristically shaped styles, appendage 1 slightly clubbed, 2 just distinguishable, anal point narrow and pointed.

Female very similar to male in colour; segments 3-5 of antennae oval, 6 equal to 4 and 5 together.

Holotype male probably lost, locality SUDAN: South of Khartoum between Wad el Zaki and Shabasha Shary.

DISTRIBUTION. SUDAN: 9 ♂, Wad Medani, ii.1952 (*D. J. Lewis*); 5 ♂, Tonga, Adok and Shambe, xi.1953 (*E. T. M. Reid*). CAPE PROVINCE: 2 ♂, 1 ♀, Berg R., Piquetberg; 1 ♂, Wellington, v.1953 (all coll. *K. M. F. Scott*).

***Chironomus (Cryptochironomus) pullatus* sp. n.**

A small black species with reduced tibial spurs which are hardly longer than the combs. Separable from the other black species by the absence of velvety bands on the abdomen, by the small size and by the shape of the male styles.

Male. Wing length 1.5 mm.

Head, antennae and mouthparts black, frontal tubercles absent, A.R. about 1.5. *Thorax* quite black and slightly shining. *Legs* dark brown, L.R. 1.5, tarsal beard absent, fifth tarsal segment of all legs flattened, pulvilli well developed; combs separate, but the spurs are short and hardly project beyond the combs; spurs distinguishable in slide preparations by their thickness and dark colour. *Wings* plain, squama with slight fringe, halteres black. *Abdomen* black; hypopygium (Text-fig. 13, *c*) with curved styles and single bilobed coxite appendage.

Female not known.

Holotype male and 10 ♂ paratypes SUDAN: Khartoum, x.1951 and 6 ♂, i.1953 (D. J. Lewis) all in British Museum.

***Chironomus (Cryptochironomus) graminicolor* Kieffer**

Cryptochironomus albiforceps Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 160 (not *Chironomus albiforceps* Kieffer, 1910, *Mem. Ind. Mus.* **2**: 231).

Cladopelma albiforceps var. *pubescens* Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924**: 280.

Cryptochironomus graminicolor Kieffer, 1925, *ibid.*: 287.

Chironomus (Cryptochironomus) reductus Freeman, 1954, *Proc. R. ent. Soc. Lond. (B)* **23**: 177 (SYN. NOV.).

A small green species with brown or black thoracic markings; A.R. about 1, L.R. 2, front legs dark, male hypopygium with broad coxite appendage and long anal point.

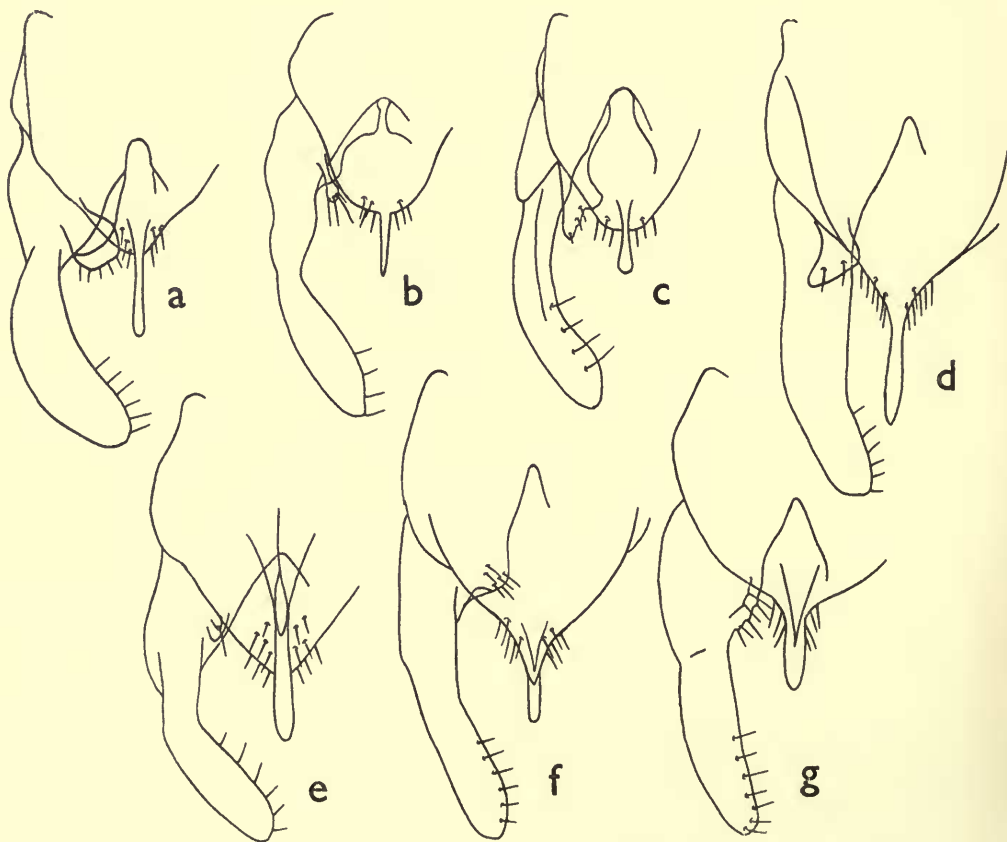


FIG. 13. Male hypopygia of *Chironomus* subg. *Cryptochironomus*. (a) *C. hirsti*; (b) *C. unicalcar*; (c) *C. pullatus*; (d) *C. graminicolor*; (e) *C. inflexus*; (f) *C. lacteiforceps*; (g) *C. nudiforceps*.

After examination of more material, it is now clear that my species is simply a paler form of *albiforceps*. Kieffer described his two species in the same paper (1923) but in different genera presumably because of his use of characters based on the minute pubescence of the pulvilli. As mentioned under the characters of the genus, it is my opinion that these characters do not exist. I choose *graminicolor* to replace *albiforceps* which is now a homonym, because of the doubtful status of *pubescens*.

Male. Wing length 1.5 mm.

Head green, antennae either brown or black, A.R. about 1 or slightly higher, frontal tubercles indistinguishable in dry specimens. *Thorax* green with some pruinosity; stripes, postnotum and sternopleuron usually black in Sudan specimens, but some paler forms do occur in South Africa in which parts of the thoracic markings are brown. *Legs* yellowish-brown or green, front legs more or less darkened; L.R. 2 or slightly more, beard absent; combs distinctly separated, each with a short spur. *Wings* plain, halteres green, squama bare. *Abdomen* green; hypopygium (Text-fig. 13, *d*) with long anal point, styles not separated from coxites and rather broad; a single broad coxite appendage, often slightly foot-shaped.

Female similar to male in colour; antennal segments 3–5 oval, 6 equal to 4 and 5 together.

Types of Kieffer's species probably lost; type locality of *albiforceps* SUDAN: Shambe; of *pubescens* EGYPT: Cairo; of *graminicolor* EGYPT: Maadi. Holotype male of *reductus* in British Museum, locality CAPE PROVINCE: Piquetberg.

DISTRIBUTION. SUDAN: 7 ♂, 2 ♀, Khartoum, ii.1952 (*D. J. Lewis*). NATAL: 1 ♂, 1 ♀, Tugela R., Royal Natal National Park, and 1 ♂, Mooi R., Rosetta, ix.1953 (*A. D. Harrison*). CAPE PROVINCE: type series of *reductus* from Berg River.

Chironomus (Cryptochironomus) inflexus sp. n.

A dark brown species with white antennal plumes, thorax uniformly covered with grey pruinosity; most easily distinguished from similarly coloured species such as *cinereithorax* by the male hypopygium with its bent styles and very small coxite appendages.

Male. Wing length 2.0 mm.

Head, antennae and mouthparts brown, plumes of antenna white, frontal tubercles absent, A.R. about 2.5. *Thorax* dark brown, uniformly covered with grey pruinosity through which stripes can just be distinguished, bristles white. *Legs* with anterior pair and femora of others brown, four posterior tibiae and tarsi paler, apices of tibiae darkened; L.R. 1.5, anterior tarsi bearded, tibial combs fused, each with a spur. *Wings* plain, whitish, halteres yellow, squama fringed. *Abdomen* dark brown; hypopygium (Text-fig. 13, *e*) with bent styles and very small coxite appendages; anal point strong and carried forwards as a ridge on IXth tergite.

Female similar to male in colour except for legs which are rather darker; segments 3–4 of antennae with short necks, 5 rather spindle-shaped, 6 equal to 4 and 5 together.

Holotype male and paratype female SUDAN: Khartoum, x.1951 (*D. J. Lewis*), both in British Museum.

Chironomus (Cryptochironomus) lacteiforceps Kieffer

Cryptochironomus lacteiforceps Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 163.

Green with reddish or yellowish-brown thoracic markings; legs uniformly pale, combs fused; male hypopygium lacking coxite appendages, separated from *nudiforceps* by its larger size and bent male styles.

Male. Wing length 2–2.3 mm.

Head and mouthparts greenish, small frontal tubercles present; antennae yellowish, pedicel reddish, A.R. 2.5. *Thorax* yellowish-green; stripes, postnotum and sternopleuron reddish or yellowish-brown. *Legs* yellowish-green, anterior ones not darker except sometimes at apices of tibiae; L.R. 1.5, beard absent, combs narrow and fused, two spurs present. *Wings* plain, halteres pale, squama fringed. *Abdomen* green; hypopygium (Text-fig. 13, *f*) not unlike *inflexus* in general appearance but coxite appendages completely absent and coxite with an inner lobe, style not as strongly bent, anal point without the ridge, IXth tergite produced so that in side view anal point appears like a downcurved finger at the end.

Female resembles male in colour; segments 3–5 of antenna oval, 6 as long as 4 and 5 together.

Type series probably lost, locality SUDAN: Shambe.

DISTRIBUTION. UGANDA: Series of both sexes at light, L. Victoria (*W. W. Macdonald* and *P. S. Corbet*). BELGIAN CONGO: 6 ♂, Elisabethville, xii.1938. TRANSVAAL: 1 ♂, Assegai R., nr. Piet Retief, ix.1954 (*A. D. Harrison*).

Chironomus (Cryptochironomus) nudiforceps Kieffer

Cryptochironomus nudiforceps Kieffer, 1923, *Ann. Soc. ent. France*, **92**: 160.

Chironomus (Cryptochironomus) monilis Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23**: 19; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 18 (SYN, NOV.).

Chironomus (Cryptochironomus) atrofasciatus Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23**: 177 (SYN. NOV.).

A green species, very similar to but slightly smaller than *albiforceps*; most easily distinguished by the hypopygial structure, the styles being straight and the coxite less produced inwardly.

I now have material from the Sudan which has enabled me to identify Kieffer's species with certainty and I can find no reason for keeping *monilis* separate. *C. atrofasciatus* appears to be simply a darker form of the same species.

Male. Wing length 1.5–2.0 mm.

Head greenish, antennae yellowish-brown, A.R. about 2, frontal tubercles absent. *Thorax* green; stripes, postnotum and sternopleuron reddish-brown or dark brown. *Legs* green, anterior tibiae and tarsi brown or blackish, L.R. about 2, beard absent, combs fused and with two short spurs. *Wings* plain, squama fringed, halteres green. *Abdomen* green; hypopygium (Text-fig. 13, *g*) with straight styles which are more or less fused to coxites; coxites lacking appendages though with a fold where they would normally arise; inner margin rounded and setose; IXth tergite more transverse than in *lacteiforceps*, anal point appearing shorter.

Female similar to male in colour; segments 3-5 of antennae oval, 6 nearly as long as 3-5 together.

Type series of *nudiforceps* probably lost, locality SUDAN: between Wad el Zaki and Shabasha Shary. Holotype males of *monilis* and *atrofasciatus* in British Museum, both from CAPE PROVINCE: Berg R., Piquetberg.

DISTRIBUTION. SUDAN: 2 ♂, 2 ♀, Nile above Alaki, i.1923 (*S. Hirst*); 1 ♂, Khartoum, ii.1923 (*S. Hirst*); 1 ♂, Khartoum, ii.1952 (*D. J. Lewis*); 1 ♂, Shambe, ix.1953 (*E. T. M. Reid*). BELGIAN CONGO: Series from Parc National Albert (*Damas* and *Verbeke*). NATAL: 2 ♂, Mooi R., ix.1953 (*A. D. Harrison*). CAPE PROVINCE: Berg R., Piquetberg.

Unrecognized Species of Cryptochironomus

Besides species which I have been able to recognize, the following 12 were described by Kieffer from the female alone and have so far proved to be unrecognizable, at any rate from the existing collections. It is probable that at least some will never be recognized, especially as the types of eight of them are lost.

1. *Chironomus tropicalis*, Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* 1 : 17. This is possibly an earlier description of *C. (Cryptochironomus) lindneri*, but the type, which is in the Paris Museum, requires re-examination for definite identification. Type locality KENYA: Naivasha.

2. *Chironomus kikuyui* Kieffer, 1913, *Ibid.* : 18. This again may be *lindneri* although the anterior legs are pale. The type is also in the Paris Museum and must be re-examined for definite identification. Type locality KENYA: Kijabé.

3. *Chironomus brevicornis* Kieffer, 1918, *Ann. Mus. nat. Hung.* 16 : 70. I have seen the type which is in the Hungarian National Museum. It is a small green female of a species of *Cryptochironomus* 1.8 mm. long and the species is quite unrecognizable. Type locality ETHIOPIA: Lac Dembel.

4. *Cladopelma oculare* Kieffer, 1922, *Ann. Soc. ent. France*, 91 : 51. Kieffer states that the eyes practically meet below, presumably he means above the mouthparts although this is not stated; that the mesonotal stripes are brown, the central being joined to the posterior border by a line; and that nearly the distal halves of the femora are black; length 5 mm. No such species is known to me, although the pattern suggests *Chironomus (Dicrotendipes) regalis* Goetghebuer. Type locality FRENCH CAMEROONS: Kribi, type probably lost.

5. *Cladopelma nilotes* Kieffer, 1922, *Ibid.* 91 : 53. A yellowish insect, cross-vein brown-black, knees and apices of tibiae darkened, posterior border of abdominal tergites 2-6 with a small dark spot each side, length 4.5 mm. This may be the female of a species of *Chironomus* sens. str. Type probably lost, locality SUDAN: Shambe.

6. *Cryptochironomus subfusiformis* Kieffer, 1923, *Ibid.* 92 : 158. Brownish-yellow, 2 mm. long, segments 3-5 of antennae fusiform, palpi short, L.R. 2.25. Type probably lost, locality FRENCH CAMEROONS: Kribi.

7. *C. nilophilus* Kieffer, 1923, *Ibid.* 92 : 158. Whitish, length 2.5 mm., segments 3-5 of antennae oval, palpi short, mesonotal stripes sandy coloured, anterior tibia

and apical two-thirds of femur brown. Type probably lost, locality SUDAN: Shambe.

8. *C. ocularis* Kieffer, 1923, *Ibid.* 92 : 159. Pale yellow, length 2 mm., eyes separated by two-thirds of their length, segments 3-5 of antennae oval, legs whitish. Type probably lost, locality SUDAN: S. of Khartoum. This may be *forcipatus* Freeman.

9. *C. baeus* Kieffer, 1923, *Ibid.* 92 : 159. Length 1.5 mm. Separated from previous species only by the eyes being about half their length apart. Type probably lost, locality SUDAN: Shambe. This is possibly a synonym of *ocularis*.

10. *C. pumilio* Kieffer, 1923, *Ibid.* 92 : 162. Entirely pale yellow, length 1.8 mm. Distinguished from other pale species by the eyes being separated by only half their terminal width. Type probably lost, locality SUDAN: Mongola.

11. *C. pygmaeus* Kieffer, 1923, *Ibid.* 92 : 165. Yellowish-white, length 1.5 mm. Pulvilli said to be narrow, eyes separated by one and a half times their terminal width. Type probably lost, locality FRENCH CAMEROONS: Kribi.

12. *Psectrocladius rhodesiae* Kieffer, 1924, *Ann. Soc. sci. Brux.* 43 (1) : 260. I have seen the type which is in South African Museum and have found it to be a much damaged female of a species of *Cryptochironomus* very similar to *forcipatus* but with darker legs. I prefer to regard it as an uncertain species for the present. Type locality S. RHODESIA: Salisbury.

Genus *NILODOSIS* Kieffer

Nilodosis Kieffer, 1921, *Ann. Soc. ent. France*, 90 : 30; Kieffer, 1922, *ibid.* 91 : 48; Freeman, 1957, *Explor. Hydrobiol. L. Kivu, Ed., Albert, Bruxelles* 3 : 215.

Fairly large dark species, thorax with grey pruinosity; frontal tubercles absent; male antenna with 14 segments, female with 6; palpi not reduced. Prothorax two-lobed and rather similar to *Chironomus* subgenus *Endochironomus* but may be more reduced; anterior tibia with long curved spine on conical scale (Text-fig. 2, c), posterior tibiae with separate conical combs each carrying a short spur, pulvilli absent. Wings faintly clouded, R_{2+3} ending near midway between R_1 and R_{4+5} , posterior fork below cross-vein, squama fringed. Abdomen of the female of at least the type species (*N. fusca* Kieffer), ending in a curved finger-shaped process. Male hypopygium with two coxite appendages, styles rather long and narrow.

Although this genus resembles *Chironomus* (*Endochironomus*) in many ways, the strong anterior tibial spur and the absence of pulvilli are probably sufficient for it to be considered distinct. The combs do not differ from those of other genera, as stated by Kieffer. Only two species of the genus are known, both from Africa south of the Sahara.

KEY TO SPECIES OF *Nilodosis* KIEFFER

- | | |
|--|-----------------------|
| Thorax with three or five longitudinal silvery stripes, male tarsus not bearded,
appendage 1 of hypopygium elongate (Text-fig. 14, b) | <i>fusca</i> Kieffer |
| Thorax uniformly grey or with only indistinct stripes, male tarsus bearded,
appendage 1 broad, sometimes hooked (Text-fig. 14, a) | <i>grisea</i> Freeman |

Nilodosia fusca Kieffer

Nilodosia fusca Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 48.

Endochironomus ituriensis Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 461 (SYN. NOV.).

Blackish, thorax strongly pruinose, especially along the hair lines to give a three-striped appearance, female may have lateral margins silvery as well; tarsi yellowish, at least basally on basitarsus; wings with faint grey tinge and with pale spots near the apices of the cells; female abdomen with curved finger-like process at apex.

Male. Wing length 2.5–3.5 mm.

Head and mouthparts dark brown, frontal tubercles absent, A.R. 2.5. *Thorax* with grey or shimmering pruinosity on a dark brown or blackish background; hair lines especially pruinose and stand out as three silvery grey lines, hairs whitish; prothorax just visible from above. *Legs* blackish, extreme bases of femora and of tibiae yellowish, tarsi with segments 1–2 or 1–3 yellowish on basal half or more; anterior basitarsus may be yellow with dark apex or there may be an additional broad central dark band; anterior tibia with strong curved spur, L.R. about 1.9, pulvilli absent. *Wings* (Pl. 1, fig. j) grey tinged and with three pale areas at apices of cells and pale areas in anal cell. Halteres brown. *Abdomen* very dark brown or blackish, with pale hairs. Hypopygium (Text-fig 14, b) with elongate style and appendage 1.

Female resembles male in colour and general structure but is often darker; lateral mesonotal margins may be silvery, making five stripes in all; segments 3–5 of antennae with short necks, 6 equal to 4 and 5 together; wing length may be as much as 4.5 mm. Abdomen with last tergite produced backwards as a curved finger-like process longer than the cerci.

The type series of *fusca* is probably lost, type locality SUDAN: Shambe; I have seen the type male of *ituriensis* in Musée Royal du Congo Belge and can confirm its identity, type locality BELGIAN CONGO: Ituri, Mahagi-Port.

DISTRIBUTION. GOLD COAST: 1 ♂, Red Volta, Nangodi, x.1954 (*G. Crisp*). NIGERIA: 1 ♂, Eket, vii.1911. SUDAN: 5 ♂, 1 ♀ Liednum, nr. Wau, iii–iv.1955 (*E. T. M. Reid*). UGANDA: 2 ♀, Busungwe Bay, ix–x.1954 (*P. S. Corbet*). BELGIAN CONGO: 1 ♂, Basoko, ii.1925 (*Del Javero*).

Nilodosia grisea Freeman

Nilodosia grisea Freeman, 1957, *Explor. Hydrobiol. L. Kivu. Ed. Albert*, Bruxelles **3** : 215.

Very similar to *fusca*, but prothorax more reduced, mesonotum not distinctly striped, wing pale areas more extensive and appendage 1 of male hypopygium broad; in addition the male tarsi are bearded.

Male. Wing length 3.0 mm.

Head blackish or dark grey, antennal flagellum brown, plumes pale, A.R. about 3, frontal tubercles absent. *Thorax* covered with plain grey dusting and without distinct stripes; dorso-central bristles pale and not very conspicuous; prothorax more reduced than in *fusca* and not visible from above. *Legs* mainly blackish; basitarsi, anterior tibiae centrally and bases of femora yellowish; L.R. 1.75, anterior tarsi with sparse beard, pulvilli absent; anterior tibial scale conical and ending in a

curved spur. *Wings* faintly clouded and with pale areas more extensive than in *fusca* and reaching the margin of the wing, cross-vein blackened; halteres dark. *Abdomen* black and with pale hair; hypopygium (Text-fig. 14, *a*) with long coxites and straight styles; appendage 1 short and broad, with long hairs and sometimes a slight hook at the apex; appendage 2 short and with long curved hairs.

Female not known.

DISTRIBUTION. Known only from the type series of 5 ♂, BELGIAN CONGO: Albertville, viii.1953 (*J. Verbeke*). Holotype in Institut Royal des Sciences Naturelles de Belgique.

Genus *HENRARDIA* Goetghebuer

Henrardia Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 455.

Male antenna with 14 segments, female with 6; palpi normal; frontal tubercles absent; pronotum not visible from above, of medium development; anterior tibial

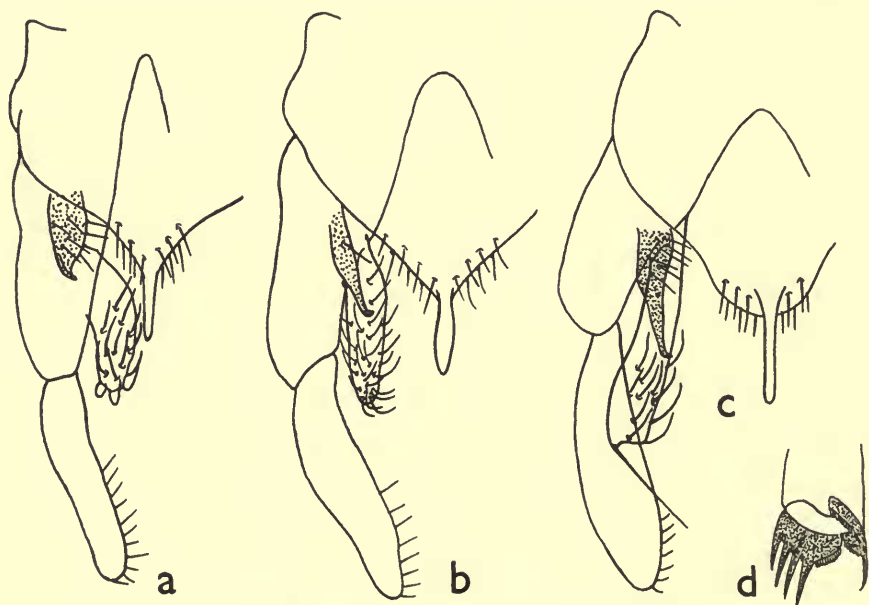


FIG. 14. *Nilodosis* and *Henrardia*; (a)–(c) male hypopygia, (d) apex of middle tibia. (a) *N. grisea*; (b) *N. fusca*; (c) and (d) *H. quadrispinosa*.

scale oval and with a short sharp spine; middle tibia with outer comb armed with four spurs (Text-fig. 14, *d*), posterior tibial combs fused and each with a single spur; pulvilli present; wings clear, R_{2+3} separated from R_1 at apex, posterior fork slightly distal to cross-vein. Male hypopygium rather similar to some species of *Polypedilum*, styles rounded at apex, appendage 1 narrow, appendage 2 with a long hair at apex.

Only one species, the type of the genus, is known. It seems unlikely that the mid-tibial comb is aberrant, because nine specimens from five localities all show the same feature.

Henrardia quadrispinosa Goetghebuer*Henrardia quadrispinosa* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 455.

Medium-sized, brown, abdomen with pruinose bands ; easily distinguished from other African species of the subfamily by the four spurs on the outer comb of the middle tibia.

Male. Wing length 2.5–3.0 mm.

Head, mouthparts and antennae brown, A.R. about 3. *Thorax* brown, lightly pruinose, bristles long and brown. *Legs* pale brown, anterior pair slightly darker, L.R. 1.3, anterior femur and tibia subequal. *Wings* unmarked, squama fringed. *Abdomen* brown, each segment pruinose at the apex ; hypopygium (Text-fig. 14, c) as described above.

Female similar to male in colour and leg structure ; segments 3–5 of antenna with long necks, whorl hairs long, those of segment 5 reaching beyond apex of 6, which is less than twice as long as segment 5.

I have seen the holotype male which is in Musée Royal du Congo Belge, type locality BELGIAN CONGO : Nyangwe.

DISTRIBUTION : FRENCH WEST AFRICA : 1 ♂, Haute Volta, Tougan, xi.1954 and 2 ♂, Bobo Dioulasso, ix. 1956 (*J. Hamon*). BELGIAN CONGO : 2 ♀, Eala, iii–iv.1936 (*J. Ghesquière*) ; 3 ♂, Nyangwe, iv.1924 (*F. Henrard*) ; 1 ♂, Maka Lualaba, i.1939 (*H. J. Brédo*).

Genus *STENOCHIRONOMUS* Kieffer

Stenochironomus Kieffer, 1919, *Ent. Mitt.* **8** : 44 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 56 ; Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 459 ; Townes, 1945, *Amer. midl. Nat.* **34** : 84. *Chironomus* subgenus *Stenochironomus* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 395.

Antennae of male with 14 segments, of female with 6 ; frontal tubercles absent, palpi not reduced. Pronotum much reduced and far surpassed by the mesonotum which projects as a cone over the head ; acrostichal bristles long and easily visible as a double row extending back to the middle of the scutum. R_{2+3} close to R_1 at the apex, wing membrane without macrotrichia, squama fringed. Scale of anterior tibia elongate and sometimes with a short spur at the tip, pulvilli well developed, combs of middle and posterior tibiae fused, each with a spur in most species, the inner spur may occasionally be reduced or absent. Male hypopygium very characteristic, anal point usually standing up and bent at the apex, appendage 1 short and inconspicuous, appendage 2 long, narrow and curved, with an articulated spine and a number of long hairs at the tip, styles long and with a few long hairs on their inner margin.

Goetghebuer fixed the type species as *S. gibbus* Fabricius (= *S. flexilis* auctt. nec Linnaeus), a fixation which invalidates Townes's later fixation of *S. pulchripennis*.

Stenochironomus is a distinctive genus, readily recognizable by the greatly produced mesonotum, well-developed acrostichal bristles and peculiar male hypopygium ; the cone-shaped mesonotum resembles that of *Microtendipes* and *Collartiella*. The species from Africa south of the Sahara are not at all easy to separate from each

other because they are uniform in structure and variable in colour. The male genitalia do not offer clear and concise characters for the separation of the species and are of doubtful value for this purpose, although I have described and figured them wherever possible. It seems that the concept of each species is best built up from the general facies and pattern rather than on more definite structural and colour characters.

Kieffer has described seven African species, all from Kribi in the French Cameroons, the types of which are probably lost. Two of these have colour patterns but the other five are all pale and unmarked and were separated by Kieffer on details of the structure of the pulvilli and male hypopygium. As explained under *S. spatuliger* below, not all of these differences can be accepted and it seems likely that no more than two and possibly only one species is present in these pale forms. Goetghebuer has described two species, placing one in *Chironomus* s. str.; this is probably a synonym of one of Kieffer's species,

KEY TO AFRICAN SPECIES OF *Stenochironomus*

- | | |
|---|-----------------------------|
| 1. Thorax without dark markings; legs pale | 2 |
| Thorax with at least a pair of dark spots on the lateral stripes; legs often partially dark | 4 |
| 2. Posterior tibia with a single spur only | <i>harrisoni</i> sp. n. |
| Posterior tibia with two spurs | 3 |
| 3. Anal point of male enlarged at apex only (Text-fig. 15, a) | <i>spatuliger</i> Kieffer |
| Anal point of male broadened along its length (Text-fig. 15, b) | <i>polychaetus</i> Kieffer |
| 4. Wings with a dark transverse band near the middle | 5 |
| Wings either unmarked or darker in basal half (cf. <i>bipunctatus</i>) | 8 |
| 5. Wing markings more extensive (Pl. I, fig. 1) | <i>edwardsi</i> Freeman |
| Wing markings more in the form of a transverse band | 6 |
| 6. All knees black | <i>pustulatus</i> Freeman |
| Dark markings on legs confined to anterior tibiae, or tibiae completely pale | 7 |
| 7. All legs completely pale | <i>bipunctatus</i> Kieffer |
| Anterior tibiae dark at base and apex | <i>micronyx</i> Goetghebuer |
| 8. All femora and tibiae black | <i>albicoxa</i> sp. n. |
| At least middle femora and tibiae pale | 9 |
| 9. Anterior tibial scale with small spur (Text-fig. 2, e) | <i>atroconus</i> Freeman |
| Anterior tibial scale unarmed | <i>antennalis</i> Kieffer |

Stenochironomus spatuliger Kieffer

Stenochironomus spatuliger Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 60.

? *Stenochironomus trispinosus* Kieffer, 1922, *ibid.* **91** : 60.

? *Stenochironomus pygmaeus* Kieffer, 1922, *ibid.* **91** : 58.

A small pale yellowish or pale green species without dark markings, any dark areas on abdomen being caused by gut contents; anterior tibial scale unarmed, posterior tibial combs each with a spur. Distinguished from *polychaetus* by the narrower anal point of the male which is not enlarged basally.

Of the five pale species described by Kieffer in 1922 from Kribi, *pygmaeus* was

separated from the others by the narrower pulvilli, but the hypopygium as drawn by Kieffer is almost identical with that of *spatuliger*. The width and branching of the pulvilli was often used by him for separating species and genera but I have seldom been able to appreciate these differences and am forced to conclude that he must have examined them from different aspects. I am therefore treating *pygmaeus* as a probable synonym of *spatuliger* even though the size quoted by Kieffer is rather small.

The other four species were separated by the direction in which the apical spine of appendage 2 pointed, by the number and disposition of the hairs on appendage 1 and by the shape of the anal point. The apical spine is movable to a certain extent and may differ in angle on the two sides of the same specimen, which renders this character useless. Appendage 1 bears setae in all the species that I have been able to examine, but they are often difficult to distinguish which may account for the bare appendages figured for *pygmaeus* and *kribiensis*. The three apical hairs of *spatuliger* are often closer together and easier to distinguish, no doubt causing Kieffer to draw only these three in the figures of *spatuliger* and *trispinosus*. In *polychaetus* he has drawn appendage 1 with the full number of hairs, but the pointed shape shows that it was drawn from the side, which is probably why more hairs were noticed.

There is a good case for considering all five to be descriptions of the same species but a specimen from Gold Coast has a wider anal point and probably represents *polychaetus*; whether it is really distinct or only a variety is not certain. The other specimens available to me agree well with *spatuliger*. A further series from Kribi might help to solve the problem of how many of these names are really valid but until then I prefer not to follow page priority but to use the more certain of the names, that is, *spatuliger* and *polychaetus* and to consider the others as probable synonyms of these.

Male. Wing length 1.5–2.0 mm.

Head, mouthparts and antennae pale yellow, frontal tubercles absent, A.R. about 1.5. *Thorax* whitish-yellow, stripes either indistinguishable or rather darker yellow, dorso-central bristles fairly close together, irregularly biserial posteriorly. *Legs* pale yellow, unmarked; anterior tibial scale unarmed, posterior tibial combs each with a spur, tarsal beard absent, L.R. hardly more than 1. *Wings* pale and unmarked, hairs of posterior fringe slightly flattened, halteres white. *Abdomen* very pale, any dark markings being caused by gut contents; hypopygium (Text-figs. 15, *a*, *g*) with narrow anal point which is broadened apically, lateral aspect as shown; appendage 1 with a row of hairs, appendage 2 and style normal for the genus.

Female similar to male in colour; antennal segments 3–5 with well-developed necks, segment 6 about one and a half times as long as 5.

Types of all three species probably lost, all from FRENCH CAMEROONS: Kribi.

DISTRIBUTION. SUDAN: 3 ♂, Khartoum, i. 1923 (*S. Hirst*); 12 ♂, 6 ♀, Khartoum; x. 1951 (*D. J. Lewis*). NIGERIA: 1 ♀, Alizaga, i. 1955 (*R. W. Crosskey*). GOLD COAST: 5 ♂, 11 ♀, Red Volta, Nangodi, x. 1954 (*G. Crisp*). BELGIAN CONGO: 2 ♂, 1 ♀, Elisabethville, ii. 1939 (*H. J. Brédo*); 1 ♂, Maka Lualaba, i. 1939 (*H. J. Brédo*).

***Stenochironomus polychaetus* Kieffer**

Stenochironomus polychaetus Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 61.

? *Stenochironomus kribiensis* Kieffer, 1922, *ibid.* **91** : 59.

As explained under *spatuliger*, I am not adopting page priority for the name of this species. It is a small pale species, only separable from *spatuliger* by the broader anal point (Text-figs. 15, *b*, *h*) ; further material may show it to be a variety only.

Both types probably lost, both from FRENCH CAMEROONS : Kribi.

DISTRIBUTION. GOLD COAST : 1 ♂, near Kumasi, x.1952 (*J. Bowden*).

***Stenochironomus bipunctatus* Kieffer**

Stenochironomus bipunctatus Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 57.

? *Chironomus bipustulatus* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 472.

This species can be distinguished from all others known to me from Africa south of the Sahara by the presence of a pair of round black spots at the anterior ends of the lateral stripes, combined with completely pale legs and abdomen. Goetghebuer's specimen has the apex of the postnotum black as well.

I have been able to see Goetghebuer's type and find that the wing has a faint transverse cloud at the level of the cross-vein which he overlooked. Kieffer does not mention the cloud but he also may have overlooked it ; for this reason I am leaving the synonymy in doubt. Kieffer's figure of the male hypopygium is too generalized to be of any use for defining the species.

Kieffer gives the lengths as male 4 mm., female 2.5 mm.; Goetghebuer states his female to be 6 mm. long, but this is exaggerated, 3.25 mm. being the correct figure.

Type specimens of *bipunctatus* probably lost, locality FRENCH CAMEROONS : Kribi ; holotype female of *bipustulatus* is in the Musée Royal du Congo Belge, locality, BELGIAN CONGO : Vitshumbi. No further specimens are known to me.

***Stenochironomus antennalis* Kieffer**

Stenochironomus antennalis Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 58 ; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 375.

Thoracic stripes blackish and fused, anterior tibiae and sometimes femora dark ; shoulders, abdomen and remainder of legs pale ; distinguished from *atrocomus* by its much smaller size and unarmed anterior tibial scale.

Male. Wing length 2 mm.

Head, mouthparts and antennae yellowish, frontal tubercles absent, A.R. about 1. *Thorax* mainly black because of the fused thoracic stripes ; sternopleuron and postnotum also black, anterior margin, shoulders and scutellum pale ; dorso-central bristles pale and widely spaced. *Legs* yellow, anterior tibiae dark, apex of anterior femur vaguely darkened or whole femur yellowish-brown ; L.R. about 1.2 or less, scale unarmed, posterior tibial combs each with a spur. *Wings* unmarked, halteres pale. *Abdomen* yellow, hypopygium (Text-fig. 15, *c*) with narrow anal point, appendage 1 with three hairs at the apex and two near the base.

Female according to Kieffer's description very similar.

Holotype female probably lost.

DISTRIBUTION. Type locality FRENCH CAMEROONS : Kribi. Additional specimen, TRANSVAAL : 1 ♂, Kruger National Park, Skukuza, iv. 1951 (*P. Brinck*).

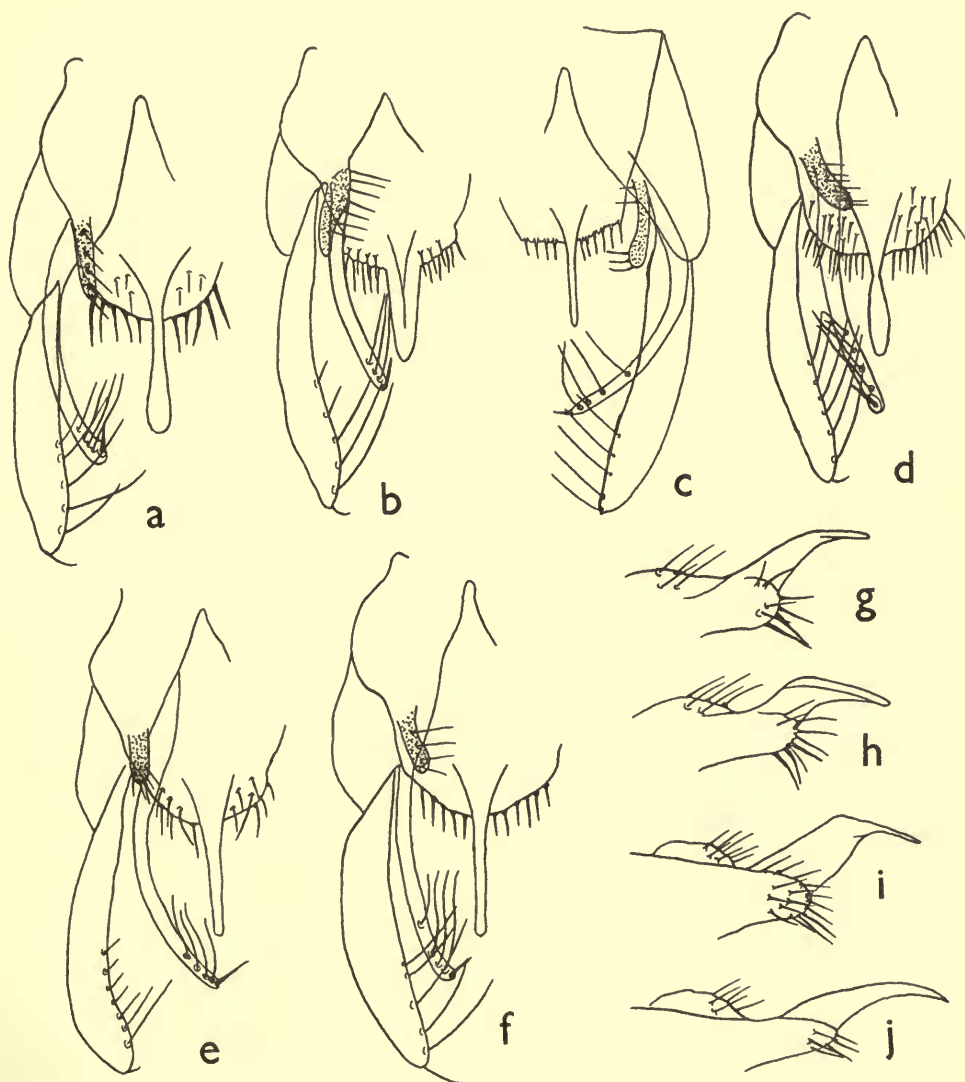


FIG. 15. Male hypopygia of *Stenochironomus*; (a)–(f) in dorsal aspect, (g)–(j) anal point in lateral aspect. (a) *S. spatuliger*; (b) *S. polychaetus*; (c) *S. antennalis*; (d) *S. atroconus*; (e) *S. micronyx*; (f) *S. edwardsi*; (g) *S. spatuliger*; (h) *S. polychaetus*; (i) *S. atroconus*; (j) *S. edwardsi*.

Stenochironomus albicoxa sp. n.

Medium-sized black species, only yellow on part of pleura, coxae and trochanters, tarsi and cerci (male not known); wings darkened along costal margin basally, halteres black; separated from *antennalis* by the darker thorax, black abdomen with yellow cerci and by all the femora and tibiae being black.

Female. Wing length 2.5–3.0 mm.

Head and mouthparts dark brown, antennae paler, last segment darkened, segments 3–5 with short necks, segment 6 slightly longer than 5. *Thorax* black and shining, except for a variable amount of the pleuron and sternopleuron which are partially or completely white; scutellum black; dorso-central bristles uniserial. *Legs* with coxae and trochanters white, all femora and tibiae black, all tarsi white, L.R. about 1.75; anterior tibial scale more or less pointed but without spur; posterior tibial combs each with a spur but inner spur may be very short. *Wings* (Pl. 1, fig. k) with a greater or lesser amount of darkening along costal margin in basal half; halteres black. *Abdomen* black, cerci yellow.

Holotype female BELGIAN CONGO: Elisabethville, xii.1932 (C. Seydel). Paratypes SUDAN: 1♀, Yirol, vi–vii.1954 (E. T. M. Reid). NIGERIA: 1♀, Niger Province, Abuja, xii.1954 (R. W. Crosskey). GOLD COAST: 3♀, Red Volta, Nangodi, x.1954 (G. Crisp). Whole series in British Museum.

Stenochironomus harrisoni sp. n.

Entirely green, wings unmarked; mesonotum more produced and narrower than usual, ending anteriorly in four small tubercles; easily distinguished from other species because middle and posterior tibiae have only a single spur on the combs.

Although only the female is known and the posterior tibiae has only a single spur, it is fairly certain that this species belongs to *Stenochironomus* because the scale of the anterior tibia is produced and well-developed acrostichal bristles are present. Variation in the number of posterior tibial spurs is seen in the Palaearctic species *S. hibernicus* Edwards, a species with well-developed acrostichal bristles and typical male hypopygium originally described in *Microtendipes*. Some specimens of *S. albicoxa* sp. n. also show the inner spur reduced though not absent.

Female. Wing length 3 mm.

Head pale green tinged with brown, antennae with segments 2–4 with well-developed necks, 5 completely lacking neck, 6 about one and a half times as long as 5. *Thorax* completely green; dorso-central bristles irregularly biserial, at any rate anteriorly and rather close together; anterior mesonotal cone narrower and longer than usual, ending anteriorly in four small tubercles, acrostichal bristles well developed. *Legs* with femora pale green, remainder more yellowish; L.R. about 1.8; pulvilli large, anterior tibial scale unarmed, posterior tibiae with inner comb lacking spur, spur on outer comb curved. *Wings* unmarked, halteres green. *Abdomen* green.

Holotype female TRANSVAAL: Pongola River Settlements, ix.1954 (A. D. Harrison) in British Museum.

Stenochironomus atroconus Freeman

Stenochironomus atroconus Freeman, 1955, *Explor. Parc nat. Upemba*, Miss. de Witte, fasc. 35 (6) : 99.

One of the largest African species known to me. Colour variable, in the female holotype the mesonotal cone is black, segments 1 and 2 of abdomen and most of anterior legs also black, but other specimens show a lesser amount of black on the thorax, the greatest reduction being in the males which have the black reduced to two round spots at the anterior ends of the lateral stripes. All specimens have anterior tibiae and tarsi black and some darkening of the femur; wings unmarked; anterior tibial scale armed with a short spur; abdomen with some darkening on some basal segments.

Male. Wing length 3.25 mm.

Head, mouthparts and antennae yellowish-brown, A.R. 2.2. *Thorax* in the only two males known yellow, stripes reddish-brown, lateral ones with a large round spot at the anterior end; dorso-central bristles sparse and uniserial. *Legs* yellow; anterior tibiae and tarsi black, anterior femur dark at apex in one specimen; L.R. 1.2, anterior tibial scale armed with a short spur (Text-fig. 2, *e*), posterior tibia with two spurs. *Wings* unmarked, halteres pale. *Abdomen* yellow, segments 1-3 with a dark band along posterior margin. Hypopygium (Text-figs. 15, *d*, *i*) with anal point flattened for apical half and strongly bent, IXth tergite more hairy than in other species.

Female. Wing length 3.25-4.0 mm.

In all the specimens I have seen, the central thoracic stripe is black in addition to the black spots at the anterior ends of the lateral stripes; there is a tendency for the darkening to spread on to the shoulders and for fusion with the lateral spots so that the whole cone may be black as in the holotype. Anterior femur usually black on apical half, remainder of front leg black; abdominal darkenings more extensive, especially on segments 1 and 2 which may be completely dark. Segments 3-5 of antenna with long necks, 6 one and a half times as long as 5; anterior tibial scale armed.

Holotype female in British Museum, type locality BELGIAN CONGO : Elisabethville.

DISTRIBUTION. GOLD COAST : 1 ♀, Red Volta, Nangodi, x.1954 (*G. Crisp*). HAUET VOLTA : 1 ♂, Banfora, xii.1956 (*J. Hamon*). NIGERIA : 2 ♂, Minna, xii.1954 (*R. W. Crosskey*). BELGIAN CONGO : 2 ♀, ii.1939 and 1 ♀, iv.1939, Elisabethville (*H. J. Brédo*) also the holotype; 1 ♀, Parc National de l'Upemba; 1 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*).

Stenochironomus micronyx Goetghebuer

Stenochironomus micronyx Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 460.

Medium-sized, yellow species with two black marks on each lateral mesonotal stripe; anterior legs with dark knees and dark tips to tibiae and tarsal segments; wings with dark shade across the middle (omitted by Goetghebuer in his original description).

Male. Wing length 3–4 mm. Goetghebuer gives the length of the insect as 8 mm. but he seems to have included the antennae; the maximum body length of his type is between 5 and 6 mm.

Head yellow, mouthparts brown, A.R. nearly 4. *Thorax* yellow; lateral stripes with a round black spot anteriorly and an oval spot along the outer margin anteriorly; central stripes in my specimen each with an elongate brown spot posteriorly, centre of prescutellar area also brown; pleura whitish. *Legs* yellow, apex of anterior femur and as much as basal third of tibia dark, apices of anterior tibiae and anterior tarsal segments black; L.R. 1.3, anterior tibial scale without definite spur, posterior tibial combs each with a spur. *Wings* with a faint, fairly broad, cloud or shade distal to cross-vein and posterior fork; halteres pale. *Abdomen* yellow, each segment narrowly brown along the posterior margin; hypopygium (Text-fig. 15, *e*) with long anal point, appendage 1 with about six hairs near the apex.

Female very similar to male in colouring but wing shade extends into base of wing; antennae with segments 3–5 with long necks, 6 slightly longer than 5; in one specimen the inner margin of the lateral thoracic stripe is darkened.

I have seen the holotype male in Musée Royal du Congo Belge, locality BELGIAN CONGO: Mayumbe, Sumbi.

DISTRIBUTION. SIERRA LEONE: 3 ♀, Njala, x.1933, x.1934 and x.1935 (*E. Hargreaves*). GOLD COAST: 1 ♀, Kumasi (*W. Smith*). FRENCH CAMEROONS: 1 ♂, Douala, x.1952 (*J. Rageau*).

Stenochironomus edwardsi Freeman

Stenochironomus edwardsi Freeman, 1957, *Explor. Hydrobiol. L. Kivu, Ed., Albert, Bruxelles* 3: 216.

A variable species with shoulders pale, stripes partially brown, abdomen white. Legs darkened above and below the knees, femora with additional and variable markings, wings with transverse dark band distal to cross-vein and posterior fork which spreads into anal cell, and with variable basal darkening. Distinguished from other African species by the colour pattern, structurally very similar to other species.

Male. Wing length 2–3 mm.

Head and pedicel yellowish-brown, mouthparts and flagellum darker, A.R. about 1.2. *Thorax* yellowish, shoulders whiter, anterior half of median stripe may be whitish, lateral stripes with variable amount of darkening especially anteriorly, scutellum and postnotum at least partially brown; S. African specimens have all stripes and sternopleuron brown; dorso-central bristles uniserial. *Legs* yellow and with variable markings; Congo and Kenya specimens have apices of femora and bases of tibiae (half of anterior tibia) dark, anterior femora with central dark band, apices of tibiae and tarsal segments narrowly dark; S. African specimens have femora with a good deal of darkening and a pale band in apical half, tibiae also darker; L.R. about 1.4, anterior tibial scale unarmed, combs each carrying a spur. *Wings* (Pl. 1, fig. 1 of female) with a broad dark band distal to cross-vein and posterior fork spreading basally into anal cell, occupying half of fork cell and

including an oval pale area in cell R_5 ; wing also dark at base in some specimens. Halteres whitish. *Abdomen* whitish-yellow, with vague posterior markings caused by gut contents. Hypopygium (Text-figs. 15, *f*, *j*) very similar to other species of the genus; anal point long and narrow, evenly curved in lateral aspect, appendage 1 short and with a few hairs.

Female. Quite similar to male but usually rather darker and with more definite markings on basal halves of femora which have subapical pale bands as in S. African males. Congo female has also a sub-basal pale band on posterior and middle femora; in this specimen the basal half of wing has a good deal of extra clouding. A large specimen from 10,000 ft. on Mt. Elgon has wing length over 5 mm. Antennal segments with well-formed narrow necks, 6 a little longer than 5.

Holotype male in British Museum.

DISTRIBUTION. KENYA: Mt. Elgon, holotype and paratype, Swam River, 5,000 ft., ii.1935 (*F. W. Edwards*), heath zone, 1 ♀, 10–11,500 ft., ii.1935 (*F. W. Edwards*). UGANDA: 1 ♀, Ruwenzori Range, Namwamba Valley, 6,500 ft. (*F. W. Edwards*). BELGIAN CONGO: 1 ♂, 1 ♀, Albertville, viii.1953 (*J. Verbeke*). TRANSVAAL: 3 ♂, 1 ♀, Lydenburg Distr., Waterval, iv.1935 (*A. D. Harrison*). NATAL: 1 ♂, Mt. Currie, Kokstad, iii.1953 (*G. H. Satchell*).

Stenochironomus pustulatus Freeman

Stenochironomus pustulatus Freeman, 1955, *S. Afr. Animal Life*. Uppsala, 2: 375.

Easily distinguished from other African species by the presence of two black spots on thorax combined with blackened knees and a transverse dark band on the wing, basal to the posterior fork.

Male. Wing length 2 mm.

Head yellow, A.R. about 1. *Thorax* yellowish-white, stripes hardly indicated except for a rounded dark brown or black spot at anterior end of each lateral stripe, postnotum dark brown. *Legs* quite yellow except for knees which are sharply dark brown or black; L.R. 1·2, anterior tibial scale unarmed, posterior tibial combs each with a spur. *Wings* (Pl. 1, fig. *m* of female) with a transverse brown band at the level of the cross-vein, but basal to posterior fork and with a small cloud at apex. Halteres white. *Abdomen* with segments 1–5 pale, remainder with some darkening probably caused by gut contents; hypopygium similar to *edwardsi* in dorsal aspect, but anal point more angularly bent in side view.

Female. Very similar to male, anterior knees less dark than others in some specimens, transverse wing markings expanded in anal cell, antennal segments 3–5 with well-formed necks.

Holotype male in Lund University Collection.

DISTRIBUTION. SUDAN: 2 ♀, Amadi, vii.1954 (*E. T. M. Reid*). S. RHODESIA: 1 ♀, Salisbury, iii.1956 (*E. T. M. Reid*). TRANSVAAL: Holotype and paratype, Kruger Nat. Park, Skukuza, iv.1951 (*P. Brinck*). NATAL: 1 ♀, Howick, ix.1953 (*G. H. Satchell*). CAPE PROVINCE: 1 ♂, Betty's Bay, iii.1955 (*K. M. F. Scott*).

Genus *COLLARTIELLA* Goetghebuer*Collartiella* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 457.

Palpi reduced and with only two segments which are short and almost rounded ; antennae of male with 14 segments, of female with six. Prothorax greatly reduced, mesonotum projecting as a pointed cone beyond the head ; anterior tibia with an oval scale carrying a small spur, not unlike that of *Stenochironomus atroconus* Freeman (Text-fig. 2, e) ; other tibiae with combs fused and usually with two spurs, but the inner spur of the posterior tibia is sometimes absent and the two sides of the same specimen may not be the same in this respect ; pulvilli well developed. Vein R_{2+3} ending near R_1 , posterior fork below cross-vein, wing clouded and with pale spots and small dark dots in the only known species. Hypopygium with long sinuous styles, appendage 1 hooked and bare apically, appendage 2 short and with long hairs, coxites deeply indented, IXth tergite conical, anal point long. Whole body hairy, hairs tending to be concentrated in tufts, especially on abdomen and femora.

This genus is known only from one species with an unusual appearance, the thorax and anterior tibial scale resembling those of *Stenochironomus*, but the hypopygium showing that the two genera are distinct. It may be separated from *Stenochironomus* by the greatly reduced palpi, by the hairy body with its hair tufts and by the male hypopygial structure.

Collartiella hirsuta Goetghebuer*Collartiella hirsuta* Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* 28 : 458.

Yellowish-brown or brown, thorax with mottled pruinosity, legs very hairy, wings brown or pale brown, with clear spots.

Male. Wing length 4.25 mm.

Head yellowish-brown, unusually transverse, more than twice as wide as high, frontal tubercles absent, palpi greatly reduced, face with thick tuft of hair ; antennae brown, A.R. slightly more than 1. *Thorax* yellowish-brown with rather darker mottling on stripes, postnotum and sternopleuron ; in addition to the dark mottling there is a mottling of silvery pruinosity on these areas ; acrostichal bristles pale and well-developed, dorso-centrals long, pale and irregularly triserial, extending as broad patches in the prescutellar area, each patch about 10 setae wide ; scutellum with a tuft of hair each side. *Legs* yellowish, femora with a trace of a broad brown ring after the middle ; tibiae about two-thirds as long as femora on all legs, L.R. said by Goetghebuer to be 2.2 but in my specimen it is only 1.5 ; legs clothed with long hairs, femora with hair tufts near the apex, anterior tarsus with long beard. *Wings* (Pl. 1, fig. n of female) pale brown with clear spots and darker dots, paler than in the females ; squama fringed, halteres dark at tips. *Abdomen* yellowish, probably pruinose as in female ; clothed with long hairs which are mostly abraded in the only male available, but from the arrangement of the pits they are probably arranged especially as upstanding tufts at the bases of some or all of the segments as in female.

Hypopygium (Text-figs. 16, *a*, *b*) as described above for the genus; the deeply indented coxite and curved and sinuous styles are very characteristic.

Female very similar to male but darker and more brown in colour, abdomen may be brown and is pruinose, wing markings much stronger, hair tufts well developed; segments 3-5 of antenna fusiform, 6 equal to 4 and 5 together.

I have seen the holotype female in Musée Royal du Congo Belge.

DISTRIBUTION. UGANDA: 1 ♂, Albert Nile, Pakwach, and 7 ♀, near Laropi, iv. 1956 (*P. S. Corbet*). BELGIAN CONGO: Holotype female, Stanleyville; 1 ♀, Maka Lualaba, i. 1939 (*H. J. Brédo*).

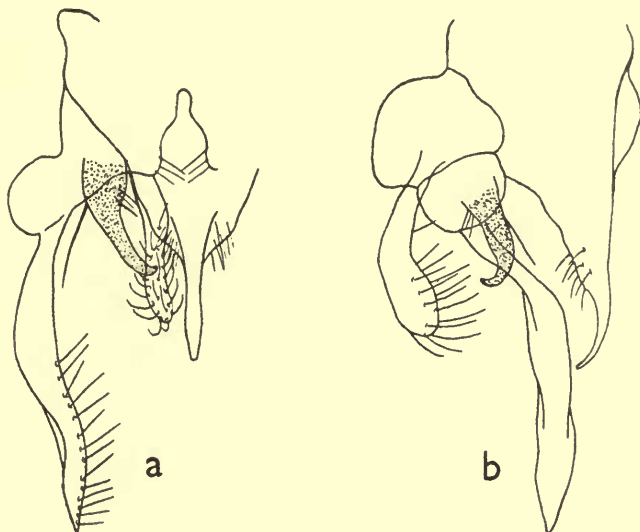


FIG. 16. Male hypopygium of *Collartiella hirsuta*. (*a*) Dorsal; (*b*) lateral.

Genus *PARATENDIPES* Kieffer

Paratendipes Kieffer, 1911, *Bull. Soc. Hist. nat. Metz* **27**: 41; Goetghebuer, 1937, in Lindner, *Fleig. Pal. Reg.* **3** (13c): 66; Townes, 1945, *Amer. midl. Nat.* **34**: 27.

Kribiodoxa Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1): 272; Kieffer, 1921, *Ann. Soc. ent. France*, **90**: 30; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924**: 296 (SYN. NOV.).

Chironomus subg. *Paratendipes* Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 395.

Male antennae with 14 segments, A.R. 1 or nearly so; female antenna with 7 segments or the two basal ones indistinctly separated, thus appearing to be 6-segmented; frontal tubercles absent, mouthparts with normal development. Pronotum reaching up to front of mesothorax, in two parts and closely applied to mesonotum; anterior tibiae usually with a short straight spur (Text-fig. 2, *f*) scale not produced, but in one African species the spur is absent; posterior tibia with two well-developed spurs, combs sometimes fused; pulvilli absent or very small. Wings bare, squama bare or fringed. Male hypopygium with style slightly

It is very similar to *P. albimanus* Meigen and to *P. nudisquama* Edwards, both from the Palaearctic Region, in hypopygial structure but the colour pattern is different.

Male. Wing length 1-1.3 mm.

Head brown or yellowish-brown, palpi dark brown, pedicel may be yellowish, A.R. 1.0. *Thorax* of most specimens reddish and shining with very little pruinosity and stripes barely distinguishable; in type series thorax darker, stripes brown, and with a good deal of pruinosity along the hair lines; scutellum and postnotum dark brown. *Legs* yellowish, femora with apical third blackish or at any rate darkened; tibiae in most specimens white, but sometimes yellow or even brown, anterior tibia with extreme base and apical third black or darkened, other tibiae, sometimes with a trace of this pattern; tarsi plain; anterior tibial spur straight (Text-fig. 2, f), L.R. varying from 1 to 1.4; posterior tibiae with combs fused and spurs short. *Wings* without markings although there is some iridescence at the cross-vein and base of fork cell; posterior fork well distal to cross-vein, squama bare; halteres white. *Abdomen* black, sometimes more or less pruinose at the incisures; hypopygium (Text-fig. 17, a) almost indistinguishable from that of the Palaearctic species *P. nudisquama* Edwards; styles yellowish and curved, appendage 1 broad and with an outwardly turned hook at apex, appendage 2 short, 2a with a narrow brush; anal point narrow.

Female resembles male but perhaps darker, cerci yellow. Antennae with seven segments, 7 equal to 5 and 6 together.

Holotype male in British Museum.

DISTRIBUTION. SIERRA LEONE: 1 ♂, Pepel, i.1956 (*D. J. Lewis*). FRENCH WEST AFRICA: 3 ♂ paratypes, Niger, Aïr, Baguezans, Irabellaben. NIGERIA: holotype male, Abuja, xii.1954. SUDAN: 1 ♂, Yirol, xii.1954 (*E. T. M. Reid*); 7 ♂, 8 ♀, Liednum nr. Wau, iii-iv.1955 (*E. T. M. Reid*). BELGIAN CONGO: 2 ♂, 1 ♀, Elisabethville (*H. J. Brédo*). S. RHODESIA: 1 ♂, Salisbury, v.1956 (*E. T. M. Reid*).

Paratendipes reidi sp. n.

A small dark species not unlike *crosskeyi* in leg colour and with similar hypopygium; easily distinguished from it and other species by the black marked wings in which the base of cell R_5 is clear.

Male. Wing length 1.3 mm.

Head, mouthparts and antennae dark brown, A.R. 0.8. *Thorax* brown, moderately shining and not pruinose, mesonotal stripes, scutellum, postnotum and sternopleuron black. *Legs* with dark femora, which are paler basally; anterior tibia whitish, basal and apical quarters black, other tibiae yellowish and more narrowly dark at base and apex; tarsi yellow; anterior tibia with curved spur, combs of other tibiae fused and with two short spurs; anterior tarsi broken. *Wings* (Pl. 1, fig. o) with distinctive black markings, more or less forming two bands, base of cell R_5 clear, no spot in apex of fork cell, squama bare; halteres white. *Abdomen* black; hypopygium with whitish styles, similar in structure to *crosskeyi*.

Female similar to male, perhaps rather darker, antennae broken.

Holotype male and 2 ♂, 1 ♀ paratypes, S. RHODESIA: Salisbury, v. 1956 (E. T. M. Reid) all in the British Museum.

Paratendipes nubilipennis sp. n.

Blackish, legs without distinct markings, hypopygium very similar to *crosskeyi*; easily separated from other African species by the extensive dark markings on the wings; posterior fork cell with a large spot, anal cell with considerable darkening.

Male. Wing length 1.3 mm.

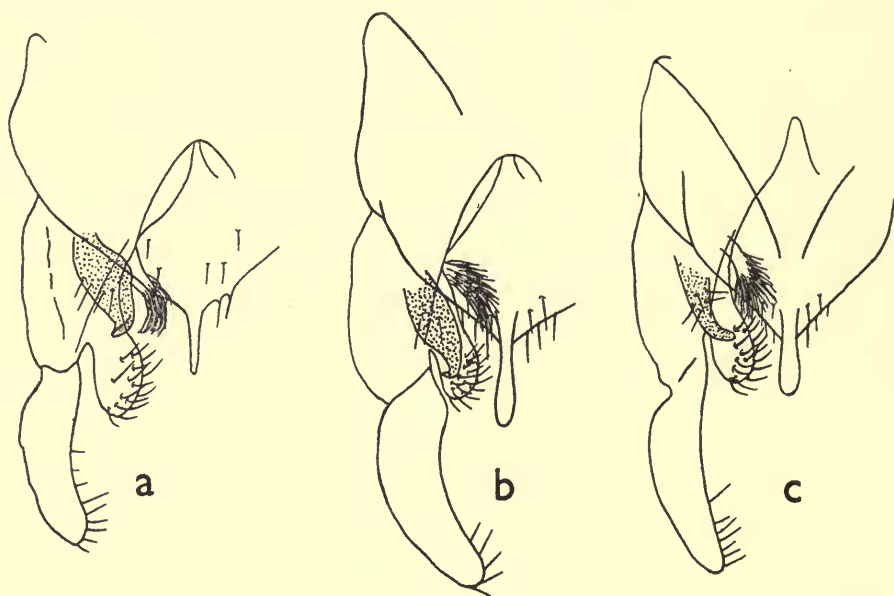


FIG. 17. Male hypopygia of *Paratendipes*. (a) *P. crosskeyi*; (b) *P. striata*; (c) *P. seydeli*.

Head, mouthparts and antennal pedicel dark brown, scape broken. *Thorax* very dark brown, hardly shining, slightly pruinose; stripes and postnotum black. *Legs* pale brown, anterior femur and apices of others dark brown or blackish, anterior tibial spur straight, combs of posterior tibiae fused and with two short spurs, L.R. 1.5. *Wings* (Pl. 1, fig. 9 of female) with grey markings over most of the surface; anal cell heavily marked, posterior fork cell with a large spot, base of R_5 with clouding which is continued basally; the large spot in the centre of cell R_5 is continued over vein M_{1+2} into cell M_2 ; squama bare, halteres pale. *Abdomen* dark brown; hypopygium very similar to *crosskeyi*, appendage 1 perhaps slightly narrower and more hooked.

Female darker than male, antennae with 6 segments only, segment 2 being formed of two more or less fused segments; 3-5 oval, 6 rather shorter than 4 and 5 together.

Holotype male NIGERIA: Alizaga, i. 1955 (R. W. Crosskey). Paratypes, NIGERIA: 1 ♀, Niger Prov., Abuja, xii. 1954 (R. W. Crosskey). N. RHODESIA: 1 ♀, Chilanga, i. 1914 (R. C. Wood). S. RHODESIA: 1 ♀, Salisbury, v. 1956 (E. T. M. Reid).

Paratendipes stictoptera Kieffer

Kribiodoxa stictoptera Kieffer, 1922, *Ann. Soc. ent. France*, 91 : 49.

I have seen no specimens which fit Kieffer's description of this species precisely, but the presence of an anterior tibial spur, the reduction of the pulvilli and the shape of the male styles make it virtually certain that the species belongs to *Paratendipes*. The female antenna is 6-segmented, but that in itself is not sufficient for generic separation. Little reliance can be placed on the figure of the male genitalia which seems to be semi-diagrammatic, except for the style shape; the figure suggests that appendage 1 is broad and it is probable that the genitalia resemble those of *crosskeyi*. It can be distinguished from *reidi* and *nubilipennis* by the absence of markings in the anal cell and cell M_2 and it is possibly similar to *striata*, but wing markings suggest it is different. The following are the important features extracted from the original description.

Length of male 4 mm., of female 3 mm. Brownish-yellow with thoracic markings brown-black; abdomen brown-black, hypopygium white; halteres brown; legs white, apices of tarsal segments and distal halves of segments 3-4 of anterior tarsi black; all femora except the apices, middle tibiae except the base, and a ring in the middle of the posterior tibiae brownish; anterior tibia a little shorter than femur, L.R. 1-6. Wings with six feeble grey spots, of which three are in cell R_5 , the first filling the basal quarter, the second square and a little beyond the middle, the third small, at the extremity and confluent with a fourth small one at the extremity of cell M_2 ; the fifth spot is small and is in the posterior fork cell beneath the extremity of vein M_{3+4} ; sixth in the form of a tract bordering each side of Cu_1 and prolonged basally along the wing margin.

Type series probably lost, locality FRENCH CAMEROONS : Kribi.

Paratendipes striata Kieffer

Kribiodoxa striata Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, 1924 : 294.

Rather larger than *crosskeyi*; darker and thorax with grey pruinosity. Wing markings vague and more in the form of seams along veins except for clouds in middle and at apex of cell R_5 . It seems quite similar to *stictoptera* but the wing markings do not agree, in particular there is no spot at the apex of the posterior fork cell.

Male. Wing length 1.5-2.0 mm.

Head and mouthparts dark brown, pedicel grey pruinose, A.R. about 1. *Thorax* dark brown, mesonotal stripes black, whole thorax with grey pruinosity. *Legs* yellowish, femora dark brown, paler at base and apex, four posterior tibiae each with a broad dark ring in basal half, apices of tarsal segments of posterior legs darkened, anterior tarsi broken; anterior tibia with a short straight spur, posterior tibial combs fused but not as completely as in *crosskeyi*, with two spurs. *Wings* (Pl. 1, fig. *p*) with vague clouding in form of seams along the veins, cell R_5 with a faint quadrate spot near the centre and a smaller more rounded one below the apex of R_{4+5} ; squama fringed, halteres brown. *Abdomen* black or very dark brown; hypopygium (Text-fig. 17, *b*) paler and very similar to that of *crosskeyi*, but styles

more strongly bent, anal point wider, appendage 1 narrower at apex, 2a more bushy.

Female not known to me, but from Kieffer's description quite similar to male; antennae 6-segmented, 6 twice as long as 5.

Holotype female probably lost, locality EGYPT: Maadi.

DISTRIBUTION. SUDAN: 11 ♂, Khartoum, x.1951 and i-ii.1952 (*D. J. Lewis*).

Paratendipes seydeli sp. n.

Thorax yellowish-brown, stripes, especially lateral ones brown, pleura with a partial dark stripe, abdomen dark brown, wings unmarked, legs yellowish, anterior pair partially dark; anterior tibiae not more than two-thirds length of femur, without spur, L.R. 2; male hypopygium with appendage 1 curved inwards.

In some respects this species is to be considered as intermediate between *Paratendipes* and *Chironomus*, but on balance its characters are more like the former than the latter and I propose to consider it a slightly anomalous species of this genus.

Male. Wing length 2-2.3 mm.

Head, mouthparts and antennae yellowish-brown, eyes nearly touching on the vertex, A.R. 1.3. *Thorax* yellowish-brown, mesonotal stripes brown or dark brown, lateral ones the darker, postnotum dark brown, pleura with a dark stripe running from the prothorax to the centre of the pleura. *Legs* yellowish, all femora brownish on apical half, anterior tibiae and tarsi brown; anterior tibia without spur; not more than two-thirds length of femur, L.R. 2; posterior four tibiae with well-developed combs each bearing a strong spur (in the holotype the middle tibiae have three spurs, but this is an aberration). *Wings* unmarked, fork longer than in *crosskeyi*, only slightly distal to cross-vein; squama bare, halteres pale. *Abdomen* dark brown; hypopygium (Text-fig. 17, c) brown, anal point wider than in *crosskeyi*, styles curved, appendage 1 curved inwardly, 2a bushy.

Female similar to male, antennae with 6 segments, 3-5 with short necks, 6 one and a half times as long as 5.

Holotype male BELGIAN CONGO: Elisabethville, xii.1932 (*C. Seydel*). Paratypes, SUDAN: 2 ♀, Melut, xi.1953 (*E. T. M. Reid*). BELGIAN CONGO: 3 ♂, 1 ♀, Elisabethville (*H. J. Brédo*). TRANSVAAL: 1 ♂, 1 ♀, Kruger Nat. Park, Skukuza, v.1955 (*A. D. Harrison*). Three paratypes returned to Institut Royal des Sciences Naturelles de Belgique, holotype and remainder of series in British Museum.

Genus *NILOTHAUMA* Kieffer

Nilothauma Kieffer, 1921, *Ann. Soc. sci. Brux.* 40 (1): 270; Kieffer, 1921, *Ann. Soc. ent. France*, 90: 27 and 37.

Kribioxenus Goetghebuer, 1928, *Faune de France* 18 (3): 18 (not Kieffer, 1921, *Ann. Soc. ent. France*, 90: 29); Edwards, 1929, *Trans. ent. Soc. Lond.* 77: 396 (as subg. of *Chironomus*); Townes, 1945, *Amer. midl. Nat.* 34: 34.

Male antenna with 14 segments, last segment not elongate, only about as long as previous three together, plumes shorter than usual; female antenna with 7 segments; frontal tubercles absent. Pronotum reduced, not visible from above;

wings without macrotrichia on the membrane, squama bare, posterior fork well beyond r-m. Anterior tibia with a long curved spur (Text-fig. 2, g), posterior tibial combs poorly formed, each with a short spur, middle tibial combs apparently with only one spur; pulvilli absent. Ninth tergite of male with one or two median horn-like processes, anal point usually broad, appendage 2a absent.

Although the species of this genus resemble *Paratendipes* in some respects, the peculiar male antennae and ninth tergite taken in conjunction with the spur structure and the greater reduction of pronotum suggest that they are best treated as a separate genus.

Goetghebuer thought that there was only one spur on the posterior tibia of the Palaearctic species *brayi* Goetghebuer, and, using Kieffer's key (1921), he placed it in the genus *Kribioxenus*. Edwards (1929) pointed out the presence of a second spur, but instead of transferring the species to another genus, he re-defined *Kribioxenus*! This re-definition has been accepted by Goetghebuer (1937) and Townes (1945) but is quite invalid as it does not allow the originally included species to remain in the genus.

Kieffer's description of *Kribioxenus* states that the anterior tibia has a short setiform spur and that the smaller of the posterior tibial combs has a long and slightly curved spur whilst the larger is unarmed; in addition the antennal ratio is 0.6. It is clear from this that the Palaearctic and Nearctic species previously placed in *Kribioxenus* cannot possibly be placed in that genus.

The African species described below is extremely similar, structurally, to "*Kribioxenus*" *brayi* Goetghebuer, differing in the presence of wing markings and it seems obvious that they belong to the same genus. Using Kieffer's (1921) key to the genera, the African species is identified without a great deal of difficulty as *Nilothauma pictipenne* Kieffer, which means that *Kribioxenus auctt. nec* Kieffer should be called *Nilothauma* Kieffer. Goetghebuer's original mistake was partially caused by Kieffer overlooking the presence of spurs on the posterior tibiae; this is understandable as they are so small.

Nilothauma pictipenne Kieffer

Nilothauma pictipenne Kieffer, 1921, *Ann. Soc. ent. France*, 90: 37.

A small species with yellowish thorax and reddish mesonotal stripes; abdomen dark, wings with pattern of dark spots, femora with preapical dark ring, male hypopygium with broad anal point and two tergal processes.

Male. Wing length 1.0 mm.

Head yellowish, palpi darker, antennae (Text-fig. 18, a) typical for the genus, with 14 segments, the last segment hardly as long as the preceding three segments together and narrower apically, plumes scanty and short. *Thorax* yellow and with some pruinosity; mesonotal stripes and sternopleuron reddish-brown, scutellum and postnotum dark brown, pleura with a horizontal dark brown stripe. *Legs* pale yellow, femora with a subapical brown band, anterior tibia dark on apical half or third; L.R. 1.25, pulvilli absent; anterior tibia with a long curved spine (Text-fig. 2, g), posterior tibiae with combs poorly formed and each with a short,

spur which is not easily seen, middle tibiae appear to have only one spur. *Wings* with dark markings as in Pl. 1, fig. 1 of female, posterior fork wide and distal to cross-vein, squama bare. *Abdomen* dark greenish-brown, hypopygium (Text-figs. 18, *b*, *c*) pale; styles pointed, appendage 1 short and with two lobes, appendage 2 curved, with about 5-6 apical hairs; anal point very broad, IXth tergite with two dorsal processes, the more basal composed of basally fused hairs, the other darker and triangular.

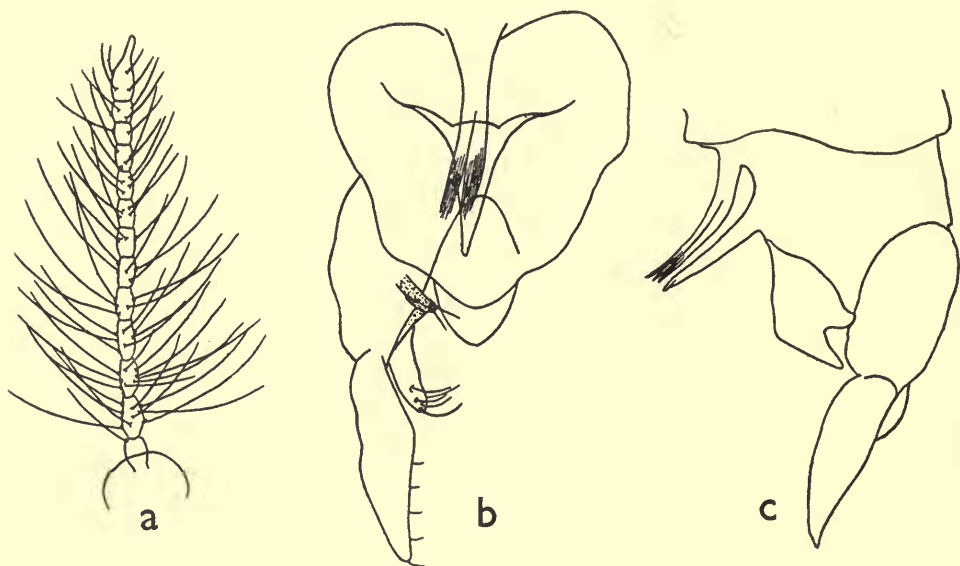


FIG. 18. *Nilothauma pictipenne*. (a) Male antenna; (b) male hypopygium, dorsal and slightly flattened; (c) male hypopygium, lateral and in natural position.

Female similar to male, antennae with 7 segments, 2-6 oval, 7 as long as 4-6 together.

Holotype male probably lost, locality SUDAN: Mongola, White Nile.

DISTRIBUTION. SUDAN: Khartoum, series of both sexes at light, x. 1951, xii. 1951 and ii. 1952 (*D. J. Lewis*).

